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ACADEMIC PROGRESS

A FOLLOW-UP STUDY OF THE FRESHMEN ENTERING THE UNIVERSITY IN 1923

BY
HAROLD A. EDGERTON
AND
HERBERT A. TOOPS

THE OHIO STATE UNIVERSITY PRESS
COLUMBUS 1929

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A Four-Year Follow-up Study of the Freshmen Entering the University in 1923

BY

Harold A. Edgerton
AND
Herbert A. Toops

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FOREWORD

The number of students in colleges today is out of all proportion to the number attending a decade ago; in this University during the past few years there has been an entering class of from twenty-five hundred to three thousand students, and some hundreds of students have entered each year with advanced standing. In addition, there is the graduate school which has also had a remarkable expansion. However, the graduates from all these sources have been numbering not more than sixteen to eighteen hundred per year. Excluding the members of the graduating class who come from the graduate school and those who entered the institution with advanced standing, probably not over one-third of the total number who enter here initially are finally graduated. During this time, also, a considerable number of students have, after the first year's experience in whole or in part, not returned to the institution, and the same is true of the second year, so that practically 50 per cent of students entering as freshmen never return for the work of the junior year.

The figures showing total enrollment during recent times, the figures showing graduates, the figures showing the number of students entering as graduates or with advanced standing or as freshmen, and the figures showing what might be called active elimination, or merely the dropping out of students along the way, are all attracting attention and are of the greatest interest in a further intelligent study of the educational scheme.

Naturally, along with this study, goes an effort to appraise the inherent value of the intelligence test and the high-school rating of beginning students, and their use as prognostication of student progress. The discovery and application of other forms of tests, or bases of prognosis, are also enlisting much attention.

Very little progress can be made in the exploration and appraisement of conditions in a great state university today without an extended accumulation of facts relating to students, especially in the respects above mentioned, a careful compilation of these actual data, and, after persistent study thereof, a serious effort to draw conclusions which may be useful in mapping a future program. Mr. Edgerton and Professor Toops have made a very valuable contribution to the study of the students by compiling and organizing the facts as they may be found on record relating to the progress through the University of a group of students over a period of four years, the normal period for graduation. This is a work of the greatest detail and has been performed with scrupulous care and exactness.

At last, then, we are presented here with the statistical data upon which our thinking for improvement of the educational process must be based. The tables and figures exhibit the thoroughness and analytical skill with which the exploration for facts has been carried on by these writers, their questions and conclusions expressed here and there are worthy of the most careful attention, and the results of their further study of these data will be awaited with keen interest. Their facts and conclusions will very clearly indicate whether we should not now proceed with a study of the living conditions of students as affecting their college activity, the teaching furnished to the student, the propriety of the location of a student in a particular college, the University's physical facilities for instruction, and what, if anything, should be done about excluding students from entering the University, on the basis of low intelligence, and whether improvements in our courses and curricula and methods cannot be made for aiding the mediocre, or average, or low student, and also enabling the high quality student to proceed according to his ability, and whether there is something the University should do about psychiatric conditions to help the student in his interests and activities.

In any case we have here elaborate facts indispensable to further progress.

GEORGE W. RIGHTMIRE, *President*

October 21, 1928.

TABLE OF CONTENTS

CHAPTER		PAGE
I.	INTRODUCTION	1
II.	COLLEGE OF ENGINEERING	5
III.	COLLEGE OF AGRICULTURE	37
IV.	COLLEGE OF ARTS	62
V.	COLLEGE OF COMMERCE	91
VI.	COLLEGE OF EDUCATION	109
VII.	COLLEGE OF PHARMACY	121
VIII.	SUMMARY AND CONCLUSIONS	133

LIST OF ILLUSTRATIONS

College of Engineering

Figure — Page

1. Persistence and Elimination of 100 Students........ 21
2. Percentage of Entrants Completing Certain Quarters of Work...... 21
3. Percentage Successful Through One Year........ 25
4. Attainments According to Intelligence Test Percentiles........ 27
5. Average First Year Scholarship of Students with Entrance Conditions 28
6. Average Persistence of Students with Entrance Conditions........ 29
7. Intelligence Percentiles of Students with Entrance Conditions....... 30
8. Relationship of Intelligence Test Score to Average First-Year Scholarship of Same Students........ 31
9. Average Credit Hours Earned in First Year by Students with Entrance Conditions........ 32
10. Progress in Hours, by Quarters, of Students at Each Intelligence Test Score........ 34
11. Progress in Points, by Quarters, of Students at Each Intelligence Test Score........ 35

College of Agriculture

12. Progress in Hours, by Quarters, of Women at Each Intelligence Test Score........ 50
13. Progress in Points, by Quarters, of Women at Each Intelligence Test Score........ 51
14. Percentage of Men Who Completed Certain Quarters of Work....... 54
15. Progress in Hours, by Quarters, of Men at Each Intelligence Test Score........ 59
16. Progress in Points, by Quarters, of Men at Each Intelligence Test Score........ 60

College of Arts

17. Retention of Men by Numbers of Quarters........ 77
18. Progress in Hours, by Quarters, by Men at Each Intelligence Test Score........ 79
19. Progress in Points, by Quarters, of Men at Each Intelligence Test Score........ 80
20. Retention of Women by Numbers of Quarters........ 85

FIGURE PAGE
21. Progress in Hours, by Quarters, of Women at Each Intelligence Test Score.......... 87
22. Progress in Points, by Quarters, of Women at Each Intelligence Test Score.......... 88
23. Per Cent at Each Intelligence Test Level Graduating in 4 Years..... 90

COLLEGE OF COMMERCE

24. Progress in Hours, by Quarters, of Men at Each Intelligence Test Score.......... 103
25. Progress in Points, by Quarters, of Men at Each Intelligence Test Score.......... 104
26. Per Cent at Each Intelligence Test Level Graduating in 4 Years..... 106

COLLEGE OF EDUCATION

27. Per Cent at Each Intelligence Test Level Graduating in 4 Years..... 117
28. Progress in Hours, by Quarters, of Students at Each Intelligence Test Level.......... 118
29. Progress in Points, by Quarters, of Students at Each Intelligence Test Level.......... 119

COLLEGE OF PHARMACY

30. Per Cents of Entrants Completing Certain Quarters of Work... 126
31. Per Cents of Entrants According to Intelligence Test Score Who Received Certificates or Degrees.......... 129
32. Progress in Hours, by Quarters, of Students at Each Intelligence Test Percentile.......... 130
33. Progress in Points, by Quarters, of Students at Each Intelligence Test Percentile.......... 131

SUMMARY AND CONCLUSIONS

34. Per Cents Completing Certain Quarters of Work (Summer Quarters Omitted).......... 144
35. Same, Including Summer Quarters.......... 144
36. Distribution of Point-Hour-Ratio of Students by High-School Records 147
37. Graduation Statistics.......... 148
38. Intelligence Test Statistics.......... 148
39. Average Credit Hours at End of Possible 15 Quarters of Residence... 149
40. Average Points at End of Possible 15 Quarters of Residence....... 150

LIST OF TABLES

TABLE PAGE

INTRODUCTION

1. Distribution of Students According to College and Sex............. 2

COLLEGE OF ENGINEERING

2. Basic Perseverence-Elimination Table............................ 20
3. Acceleration or Retardation by Quarters.......................... 22
4. Quarters Required for Degrees.................................... 23
5. Credit Hours of Students Not Graduating in 4 Years.............. 23
6. Credit Hours to Be Gained by Same Students....................... 24
7. Cumulative Point-Hour-Ratios of Non-Graduating Students......... 24
8. Distribution of Transfers.. 25
9. First Quarter Point-Hour-Ratios and Intelligence-Test Groupings... 26
10. Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation.. 26
11. Distribution of Entrants According to Entrance Conditions......... 27
12. Distribution of Entrance Conditions by High-School Subjects........ 28
13. Average Atttainments of 1–10 Percentile Students and 91–100 Percentile Students.. 33
14. Credit Hours Required for Bachelor's Degree..................... 36

COLLEGE OF AGRICULTURE

WOMEN

15. Basic Perseverence-Elimination Table............................ 46
16. Cumulative Point-Hour-Ratios of Non-Graduates.................. 47
17. Credit Hours to Be Earned After Ten Quarters.................... 47
18. Distribution of Transfers.. 47
19. Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation.. 48
20. Students of Each Intelligence Classification Who Received Degrees.. 49
21. Average Attainments of 1–10 Percentile Students and 91–100 Percentile Students.. 52

MEN

22. Basic Perseverance-Elimination Table............................ 53
23. Quarters of Attendance of Graduates............................. 54
24. Credit Hours to Be Earned After Ten Quarters.................... 55
25. Cumulative Point-Hour-Ratios of Students of Table 24............ 55

TABLE PAGE
26. Distribution of Transfers.. 56
27. Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation.. 57
28. Students of Each Intelligence Classification Who Graduated......... 58
29. Average Attainments of 1–10 Percentile Students and 91–100 Percentile Students.. 61

COLLEGE OF ARTS

MEN

30. Basic Perseverence-Elimination Table........................... 74
31. Rate of Progress of Students.. 75
32. Distribution of Entrants Who Completed at Least Ten Quarters...... 75
33. Distribution of Transfers.. 76
34. Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation.. 78
35. Average Attainments of 1–10 Percentile Students and 91–100 Percentile Students.. 81

WOMEN

36. Basic Perseverence-Elimination Table........................... 82
37. Quarters of Attendance of Students Who Graduated by June, 1927... 83
38. Cumulative Point-Hour-Ratios of Non-Graduating Students.......... 83
39. Credit Hours to be Earned After Ten Quarters.................... 83
40. Distribution of Transfers.. 84
41. Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation.. 86
42. Average Attainments of 1–10 Percentile Students and 91–100 Percentile Students.. 89

COLLEGE OF COMMERCE

MEN

43. Basic Perseverence-Elimination Table........................... 99
44. Cumulative Point-Hour-Ratios of Non-Graduating Students......... 100
45. Credit Hours to be Earned After Ten Quarters.................... 100
46. Distribution of Entrance Conditions............................. 100
47. Distribution of Transfers.. 101
48. Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation.. 102
49. Average Attainments of 1–10 Percentile Students and 91–100 Percentile Students.. 105

TABLE PAGE

WOMEN

50. Basic Perseverence-Elimination Table 107
51. Distribution of Transfers 108
52. Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation 108

COLLEGE OF EDUCATION

53. Basic Perseverence-Elimination Table 114
54. Credit Hours to be Earned by Students of Table 55 115
55. Cumulative Point-Hour-Ratios of Non-Graduating Students 115
56. Distribution of Transfers 115
57. Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation 116
58. Average Attainments of 1–10 Percentile Students and 91–100 Percentile Students 120

COLLEGE OF PHARMACY

59. Basic Perseverence-Elimination Table 125
60. Quarters of Work of Graduates 126
61. Distribution of Transfers 127
62. Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation 128
63. Average Attainments of 1–10 Percentile Students and 91–100 Percentile Students 132

SUMMARY AND CONCLUSIONS

64. Summary of Statistical Findings 140-141
65. Number of Students Finishing Work in a Given Quarter 142
66. Per Cents of Entering Students Completing Work in a Given Quarter 142
67. Number of Entrants with Quarters of Work Completed 143
68. Per Cents of Students Completing Given Number of Quarters 143
69. Per Cents of Students Who Were Retarded 145
70. Per Cents of Students Who Were Accelerated 145
71. Distribution of Transfers 146

CHAPTER I

INTRODUCTION

It is the purpose of this study to find out just what happened, academically, to a class during the first four years after their entrance to college. A study of this kind should furnish data that would make possible a better adjustment of the college to the student. Such problems as the following are discussed:

1. What are the amounts of persistence and elimination?
2. How many students graduate within four years after entrance?
3. What proportions of the entrants can be expected ultimately to graduate from the University?
4. To what extent do students transfer from one college to another within the University?
5. When do these transfers occur; and to what colleges are they made?
6. What can be said of entrance conditions in high-school subjects at the time of entrance to the University?
7. Can the quality of work done in the University be predicted at the time of entrance by use of the University Intelligence Tests, or the Entrance Board's estimate of the high-school record, or both?
8. To what available prognostic measures is persistence related?
9. What are the relative accomplishments of students of the several degrees of intelligence in terms of cumulative hours credited and cumulative points, cumulatively quarter by quarter for fifteen successive quarters of possible attendance?

The group of students used in this study consists of those who entered the Colleges of Agriculture, Arts, Commerce, Education, Engineering, and Pharmacy as freshmen (without advanced college credit) in the Autumn Quarter, 1923. In order to eliminate those who had a possible language handicap, those students who were born in non-English-speaking foreign countries were excluded. The distribution of these students according to college of entry and sex is shown in Table 1. The Colleges of Veterinary Medicine, Applied Optics, and Arts-Education were not included in this study because each has so few cases as to make any conclusions quite unreliable. Credit in Military Training, Physical Education, and Hygiene was not included in either hours or points.

TABLE 1

Distribution of Students According to College and Sex

College	Male	Female	Total
Agriculture	124	88	212
Arts	449	269	718
Commerce	342	51	393
Education	34	163	197
Engineering	347	3	350
Pharmacy	88	—	88
Total	1384	574	1958

The academic records of the 1,958 students were furnished by the Registrar's Office, thus giving as complete a record of their academic careers as could be obtained from a single source. The point system of the Ohio State University, used for comparing different qualities of work, is as follows: For each hour of A, four points are given; of B, three points; of C, two points; of D, one point; of E, zero points. The point-hour-ratio (points earned in a given period of time, divided by hours attempted in the same period) which is used as a measure of quality of scholarship by the University is used also in this study.

These students were given either Form 3 or Form 4 of the Ohio State University Intelligence Test at the time of entrance to the University. These forms of the test do not have nearly as high validity as do the forms used later (1924 to the present time), which require twice as long for their administration. Hence the relationship of the test score to scholarship, persistence, and graduation is not nearly as great as it would be if some of the later forms of the test (Forms 5, 6, . . . 14) had been available in the Autumn Quarter 1923.

The Entrance Board's estimate of the high-school record is evaluated here for the first time. The estimate is a three-categoried variable: G, good; A, average; and P, poor.

In the Spring Quarter of 1926-27, four years after entrance, 35.0 per cent were still in school trying to get a diploma, although it was their normal graduation quarter. There was considerable retardation due to temporary dropping out for one or more quarters, or due to permanent withdrawal, with the result that after 15 quarters of possible attendance only 28.7 per cent had completed as much as 12 quarters. Not all of these had graduated, however. This may be explained by such factors as failures, transfers, or small loads of work taken.

Only 18.1 per cent of the entrants graduated within four years after entrance. The per cent of entrants graduating ranged from 7.1 (men, College of Arts) to 55.7 (College of Pharmacy, two-year certificate course) in the various college groups. The low proportion of graduates in Arts is partly due to the fact that 40.5 per cent of the men who entered the College of Arts later transferred to some other college. In some of these transferred-to colleges, where the curriculum is longer (Medicine, Law, Dentistry), it is impossible for the students to graduate within four years after entrance to the University. It is our estimate, based on the attainments of the students over a four-year period, that about 34 per cent of the original 1,958 will probably ultimately graduate.

Considering the high percentage of Pharmacy entrants who completed their work, it is interesting to speculate on the effects of a two-year curriculum for the other colleges, and on the effect of the new Junior College organization on vocational competency, continuation into Senior College, etc.

The women completed, on the average, more work, measured in terms of both hours credit and points, and of higher quality, measured by point-hour-ratio, than did the men. This greater attainment was made in spite of the fact that the Intelligence Test scores of the women were about the same as those of the men.

The fact that practically one out of four students (23.0 per cent) transferred at least once, and 3.5 per cent made a second transfer indicates a lack of initial decision as to eventual college of preference. This constitutes a serious problem. To the numbers of actual transfers might be added a number who undoubtedly were maladjusted in the college of original entry, but dropped out without transferring, either from their own choice or from being unable to transfer because of the requirement of non-probationary scholastic standing at the time of transfer.

With the exception of the College of Engineering, the number of students who had entrance conditions is small. Entrance conditions are undoubtedly more symptomatic of low intellect than of specific subject-matter deficiencies.

As possible additional evidence of the need of better adjustment of the curriculum to the student, we note that the more intelligent women (the highest 20 per cent on the Intelligence Test, 81-100 percentiles), in general, tended to drop behind the attainment of some women of lesser intelligence (61-80 percentile scores on the Intelligence Test) instead of consistently improving in scholarship with every increment of intelligence, as is generally expected, and as the men actually do.

The plan of the report is to present first the statistics of the colleges separately, to be located by the chapter headings, followed by a summary chapter in which the most outstanding figures are assembled for inter-college comparisons. It has been our policy to present in the college reports the statistics only, leaving interpretation for the summary chapters and for later reports. The true significance of the figures can only be inferred in the light of additional factors not here studied. In three additional studies, which we hope to send to press within the next year, we shall try to make clear some of the bearings of such additional factors as probation, difficulty of course, amount of study time, reading and note-taking ability, physical examination, and personnel factors. One common fallacy in interpreting such data is to assume that causal relations exist wherever parallelism of two phenomena occur—resulting in the well-known beliefs in "panaceas." If our results prove anything conclusively, they prove rather that educational attainment is the result of multiple interrelated factors. In order, then, that any policies which may be built on these findings might have the utmost likelihood of validity, it has been decided to attempt during the coming year an interpretation of the results of the first ten years of experience with Intelligence Tests at this University, aided by an extensive survey of the available literature. Such a study should result in principles of wider than merely local applicability.

The writers are indebted to President George W. Rightmire, who made funds available for the study and who has also kindly consented to write the Foreword, and to Miss Edith Cockins, Registrar, who has supervised the collection of the necessary scholastic records.

CHAPTER II

THE COLLEGE OF ENGINEERING

How long do Engineering students stay in school? Can their persistence be predicted? What is the quality of their school work? Can the quality of their school work be predicted? This report attempts to answer these and similar related questions for those students who entered the College of Engineering of the Ohio State University in the Autumn Quarter of 1923, excluding only those with a possible language handicap because of birth in a non-English-speaking country. The academic records of 350 such freshmen were followed quarter by quarter for a period of four years, from the Autumn Quarter of 1923-24 to the Spring Quarter of 1926-27, inclusive.

PERSISTENCE AND ELIMINATION OF STUDENTS

Table 2 is the basic perseverance-elimination table, detailed elaboration and analysis of which gives rise to a number of the later tables and figures. The table shows the number of persons, who, at the end of any specified calendar quarter during the four years, 1923-24 to 1926-27 inclusive, had completed the number of quarters of school work indicated by the several column headings of the table. It is assumed that normal progress in school work is three quarters each year, taken usually in the Autumn, Winter and Spring quarters. The frequencies enclosed in the little boxes along the diagonal are the numbers of students making just *normal* progress by the above definition. The table shows that of the students entering the college in the Autumn Quarter of 1923-24, at the end of the quarter 341 students had completed their first quarter of work. (Originally 350 entered but 9 withdrew before completing one quarter's work. The table accounts for only those completing work.) At the end of the Winter Quarter, 1923-24, 3* students completed their first quarter of work and so were then one quarter retarded; while 325 students completed their second quarter of work at the end of this quarter, and so were not retarded. In the Spring Quarter of 1923-24, at the end of the quarter, 4 students had completed their second quarter of work and were one quarter retarded; while 299 had completed their third quarter of work and so were not retarded; and so on. The marginal totals of Table 2 furnish some gross elimination data of considerable interest.

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*These three entered the Autumn Quarter but were among the nine who withdrew before the completion of the quarter. They re-entered the following quarter and completed their first quarter of work during the Winter Quarter, 1923-24.

ELIMINATION: THE AMOUNTS OF ATTENDANCE

The column totals at the foot of the page show the number of students completing at least one, at least two, at least three, at least four, etc., quarters of work within the four-year period, during which time a student, by constant attendance, including three summer quarters, could have attended as much as 15 quarters. Of the 350 students who originally entered, 344 completed at least one quarter's work; 336 at least two quarters' work; 321 at least 3 quarters' work; and so on. *It will be noted that only 93 (26.6 per cent of the original 350 students) completed 12 quarters' work in the four-year period;* one of these being a student who graduated from Arts in eleven quarters and spent his twelfth quarter in the Graduate School.

The elimination is shown more clearly in Fig. 1, which is a graphic representation of the persistence and elimination of 100 students, "chosen at random" (percentages from the foot of Table 2) from the freshmen entering the College of Engineering in October, 1923, and followed up in June, 1927, four years later. The figure may be read as follows: Within the four-year period, of 100 students entering the College of Engineering, 98 students finished one quarter's work and 2 completed less than one quarter of work; 96 students finished two quarters and 4 completed less than two quarters, etc. Beginning with the twelfth quarter, the total elimination is slightly hastened by graduation.* For example, of the 99 per cent of students who completed less than 15 quarters, 14 per cent had, by the end of 1927, already graduated with 14 or less quarters of attendance.

ELIMINATION: IN RELATION TO TIME

The totals for the rows (right hand edge of Table 2) shows the total number and per cents of students completing work in the University (that is, in any college of the University) during any given *calendar* quarter. Thus we find that 341 students completed work during the Autumn Quarter, 1923-24; 328 completed work during the Winter Quarter, 1923-24; etc. The percentages show that 41.1 per cent of the original 350 students completed the Spring Quarter's work of 1926-27, four years after entrance. The persistence, quarter by quarter of possible attendance, is shown in Figure 2. The Summer quarters have been omitted, because Summer Quarter enrollments, as seen in Table 2, are only a small fraction of the usual enrollment, and are not representative of any general persistence or

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*All who graduated from *any* O. S. U. college are included in the "graduates."

elimination. It is seen that the marked elimination of the first two years is rather sharply curtailed during the last two years.

ACCELERATION AND RETARDATION OF STUDENTS

The acceleration and retardation of students at the end of successive calendar quarters is shown in Table 3. It is assumed that "normal" progress is three quarters of work each year. The table includes only those in attendance and completing work at the end of the quarter in question; hence the Summer Quarter frequencies are much smaller than those of the regular quarters. At the end of the Autumn Quarter, 1923, 341 students completed work, none of whom were either accelerated or retarded (0 acceleration). At the end of the Winter Quarter, 1923-24, 325 showed normal progress (0 acceleration) and 3 were retarded one quarter (— 1 acceleration). At the end of the Spring Quarter, 1924, 299 showed normal progress (0 acceleration) and 4 were retarded one quarter (— 1 acceleration). At the end of the Summer Quarter 50 had gained one quarter (+ 1 acceleration) and one was retarded one quarter (— 1 acceleration). It is to be noted that the only method of being positively accelerated, or going faster than the normal rate, is to take work in the Summer Quarter as well as in the other three quarters of the year. Thus the 2 students who show a three-quarters acceleration (+ 3 acceleration) at the completion of the Autumn Quarter 1926-27 have gone three Summer quarters in addition to the Autumn, Winter, and Spring quarters of each of the three preceding years. *Of the 144 students who completed the work of the Spring Quarter of 1926-27 (their normal "graduation quarter") 42 were accelerated (that is, had taken more than 12 quarters' work), while 51 had made normal progress and 51 were retarded.* The curriculum of the college is apparently more than a four-year curriculum, considering the ability of the students whom it receives—an ability which is above the average ability of the freshmen entering the University.*

GRADUATION

Nearly all those who received degrees by the end of the Spring Quarter, 1926-27, had secured Engineering degrees. Table 4 shows the numbers of those who originally entered the College of Engineering in 1923-24 who received degrees at the end of their eleventh, twelfth, thirteenth, fourteenth and fifteenth quarters of attendance, together with the colleges from which they graduated. *It will be noted that 27 of the 45 students securing Engineering degrees required 13 or more quarters to attain the degree; while with but one exception the eight "transfer students" graduated with 12 quarters or less of attendance.*

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*Kuenzel, M. W. and Toops, H. A., "The Relative Stability of Intelligence Levels in College," *School and Society*, Vol. 22, No. 554, August 8, 1925, pp. 176-184.

As a measure of ultimate graduation the data presented here are inadequate; since not all of the individuals entering the College of Engineering in the Autumn of 1923-24 have completed all the work in the Ohio State University that they will ever do. A few not in attendance in the Spring Quarter of 1926-27 will return, while some of the retarded students in attendance during that quarter will continue on to graduation. Can we obtain any light on the amount of probable ultimate graduation?

WORK OF STUDENTS ATTENDING ELEVEN QUARTERS WITHOUT GRADUATION

There were fifty-six students who were not retarded more than one quarter (that is, had completed at least 11 quarters of school work) who had not graduated by June, 1927. These students might reasonably be expected to have ambitions toward receiving a degree later. It is therefore desirable to ask whether the amount and quality of work of these students is such as to lead us to believe that any considerable proportion of them will achieve their ambition.

Table 5 shows the distribution of number of credit hours; that is, hours of the grades D, C, or better [*academic* credits only] to the credit of the students on the Registrar's books), according to the number of quarters of work completed, as of the end of the Spring Quarter, 1927.

It will be noted that many of those students, only one quarter of work retarded as to attendance, still have many quarters of work ahead of them. In view of the fact that students who have changed colleges have credits not acceptable towards the new degree for which they are working, it necessarily follows that the situation is really worse than is indicated by Table 6. *We may therefore conclude that a considerable number of the 56 will fail to complete their work for the degree;* however, only one of these was not in attendance during the Spring Quarter of 1926-27.*

It is evident that in the case of most of these persons the terms "freshman, sophomore, junior, and senior" are meaningless unless defined in terms of credit which will apply towards the degree sought by the student. But since the number of hours required for graduation varies, this produces a variable meaning for the term, depending on the college in which the student is enrolled. There is thus considerable argument for discarding the terms unless their meaning can be standardized by resorting to other methods.

Table 7 shows the distribution of point-hour-ratios at the last time of record of the 56 students completing 11 or more quarters of work but not receiving a degree by June, 1927.

All of those who have a point-hour-ratio of 1.80 or better might graduate without the necessity of improvement of the quality of their work. The table shows that previous elimination has weeded out practically all those of low scholarship; some 15, however, most of whom have been reinstated one or more times, have been in residence 11 or more quarters and are still below the 1.8 required for graduation.

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*Even if all 49 of the above, who are still in the Engineering College, were to graduate eventually—and some will find it impossible because of low scholarship—it would add but 14.0 per cent to the 12.8 per cent of Engineering graduates.

TRANSFERS

Table 8 shows the number of transfers out of the Engineering College to other colleges of the University according to the time of transfer and college to which transfer was made. Of the original 350 students 59 so transferred (16.8 per cent). The 59 transfers out of the college occurred at the following times: 21 made the change at the end of their first quarter; 14 at the end of the second quarter; 14 at the end of the third; 4 at the end of the fourth; and 3 each at the end of the fifth and sixth. No transfers out of Engineering were made later than the end of the sixth quarter. *Only 7 cases made a second transfer, of whom 4 returned to the College of Engineering.* The college of origin and destination of the seven retransfers are noted as a footnote on Table 8. Most of the first transfers were into either the College of Arts or the College of Commerce.

PREDICTION OF PERSISTENCE AND QUALITY OF COLLEGE WORK

From the viewpoint of student guidance, it is of great value to be able to give a valid prediction of a student's probable university success, both quantitative and qualitative. At present, however, only a few variables that can be used for this prediction at the time of entrance have been evaluated. The best one is the University Psychological Examination, usually referred to as the "University Intelligence Test." The validity of this examination has been established through nine years of use, revision, and statistical evaluation. The validity of the high-school record, as summarized by the Entrance Board, is here investigated for the first time.

Other variables now being studied in an effort to ascertain their value in the prediction of scholastic success are the data of the physical examination and certain personnel data, such as age, sex, race, number of children in family, parents' occupation, parents' education, etc.

It is found in the College of Engineering that the Intelligence Test correlates .39 with the scholarship at last time of record. The Entrance Board's Estimate of the high-school record correlates .39 with this same measure of attainment. The addition of the Intelligence Test score and Entrance Board's estimate, combined in such a way as to secure a maximum prediction of ultimate achievement, was found to be .49.

Figure 3 shows the per cent of students at each Intelligence Test score who remained in school at least one year (three quarters) and whose point-hour-ratio at the end of the first year was as good as, or better than, the minimum required for graduation—a point-hour-ratio of 1.8 or better. Of the 10-percentile students, about 35 per cent remained in school at least one year and did work as good as, or better than, the minimum required for graduation; of the 35-percentile students, 50 per cent remained in school at least a year and did work as good as, or better than, the graduation minimum. These are greater percentages of successful work done by such students of low intelligence than the corresponding figures for the University generally. They can hardly be accounted for by the fact that the test has slightly lower validity in predicting Engineering success (Engineering "requires more specific abilities") than university success generally. It points to a possible greater motivation of the students in this college. Of the 90-percentile students, about 85 per cent persisted for at least a year and did work as good as, or better than, the graduation minimum.

The data presented in such a figure can be used to forecast scholastic attainment. There are about 85 chances in 100 that a 90-percentile student will remain in school at least one year and will, during that year, do work as good as or better than the minimum quality required for graduation. There are about 60 chances in 100 that the 50-percentile student will remain in school at least a year and do work of 1.8 point-hour-ratio or better, and so on for all other intelligence ratings.

Table 9 shows the relationship between the University Intelligence Test ratings and first quarter point-hour-ratios. The scores on the Intelligence Test are here arranged by the five usual intelligence classes. The corresponding ranges of percentiles are given in the second column of the table. The table shows that none of the Class I (most intelligent) entrants average between "E" and "D" (0–.99 point-hour-ratio) during their first quarter; 8 per cent average between "D" and "C" (1.00–1.99); 38 per cent between "C" and "B" (2.00–2.99); and 54 per cent "B" or better (3.00–3.99). At the other extreme of the Intelligence Test scores are the Class V (least intelligent) students: of whom 38 per cent, during their first quarter average lower than "D" (0–.99); 25 per cent average between "D" and "C" (1.00–1.99); 37 per cent between "C" and "B" (2.00-2.99); and not any make as high as "B" (3.00–3.99).

Table 10 shows a number of facts with regard to the relationship of Intelligence Test scores to the cumulative point-hour-ratio, length of stay in school, and graduation. In this table, the following notation is employed:

1. Each table entry is some number between 1 and 15, enclosed within a circle, square, or triangle, each of the latter of which stands for one student.

2. The number is the number of quarters of school work that that student had completed between the time of his entrance (September, 1923) and June, 1927.
3. A circle around the number indicates that the student so encircled had not, up to June, 1927, received a degree from the University.
4. A square around a number indicates that the student received an Engineering degree at the end of the quarter indicated.
5. A triangle around a number shows that the student received a degree from some college other than Engineering at the end of the designated quarter.
6. The letter in the triangle with the number shows the college from which the degree was obtained.

Ag = Agriculture
A = Arts
C = Commerce
E = Education

7. There is one case indicated by a triangle with one corner off. This case persisted 12 quarters, but received a degree in the College of Arts at the end of his eleventh quarter.

In the column at the extreme left of the table in the various horizontal rows are given the range of cumulative point-hour-ratios as of record on the Registrar's books at the time of last record. At the top of the table are the ranges of Intelligence Test scores to be found in the various vertical columns of the table.

In the lowest group of Intelligence Test scores (1–10 percentile) are found fifteen cases. One of these had persisted four quarters and had a point-hour-ratio between 0 and .24. Another had persisted eight quarters and had a point-hour-ratio less than 1.00. Of the fifteen, fourteen had done work of quality *below* the minimum required for graduation.

In fact, of the 125 entering students who were below 50 (average of the University) on the Intelligence Test only 12 (9.6 per cent) graduated in four years, and all with scholarship below "B" (2.99 point-hour-ratio), while on the other hand, of the 219 who were above 50 (average) 41 graduated (18.7 per cent) and with a very evidently better scholarship as well, eight having graduated with better than "B" average, with a number of others — potential graduates — of 10, 11, and 12 quarters of attendance, who have equally high scholarship.

The attention of the University should be called to the large number of students of both high intelligence and high scholarship who drop out with from three to six quarters of attendance in the University. Why do we have this loss of the best students? The problem is urgent.

Another noteworthy fact is that, with but one exception, the eight students who transferred to other colleges and graduated, are above average in intelligence, and without exception averaged better than "C" (2.00) in their college work. Also with but one exception these students graduated in 12 quarters or less,* one even being enabled to start work in the Graduate School in the twelfth quarter. With the present burden of work required by the various curricula, an Engineering student has no opportunity of carrying an extra load during his senior year and receiving credit towards an M.A. degree as in some of the other colleges.

Of the 46 students having Intelligence Test scores between 91 and 100, eleven received degrees. Eight of these degrees were Engineering degrees (cases enclosed in squares). Three of those receiving degrees received them from some college other than Engineering (enclosed in triangle). One of these degrees was granted by the College of Commerce and the other two by the College of Education.

In all, up to June, 1927, 53 degrees were granted, and of these, 45 were Engineering degrees.

Some of the information of Table 10 is better summarized by the three curves shown in Figure 4, as follows:

A. The upper curve in Fig. 4 (Curve A) shows the per cent of students at each Intelligence Test score who remained in school at least one year (3 quarters), and whose *entire* college record shows a point-hour-ratio as good as, or better than, the minimum required for graduation (point-hour-ratio of 1.8).† Of the 5-percentile students, about 6 per cent both stay in school as long as one year and at the end of their stay in college average as high as the 1.8 minimum required for graduation. At the high end of the Intelligence Test scores, about 83 per cent of the 95-percentile students persist as long as one year and at the end of their college record have a point-hour-ratio of 1.8 or better.

B. The second curve in the figure (Curve B) shows the per cent of students at each Intelligence Test score who remained in school at least two years (6 quarters) and whose point-hour-ratio based on all of their college work was 1.8 or higher. This curve follows the three quarters curve quite closely.

C. The lower curve (Curve C) shows the per cent of students at each Intelligence Test score who graduated within four years from the time of entrance (that is, graduated by June, 1927). If the records were followed up for another year it is certain that this curve would be higher especially for the higher Intelligence Test scores. At the present time, a certain inevitable per cent of students of low intelligence, electing probably in the main the easier curricula, and content with "passing" scholarship, graduate in four years; the more intelligent students, striving for better mastery of the work carried, do not graduate within the four-year period in appreciably greater numbers, although among them are many potential graduates who, by 13 to 15 or more quarters of attendance, will ultimately graduate with honor to themselves and to the University.

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*See footnote of Table 10.

†Compare Curve A of Fig. 4 with Fig. 3 to note the effect of more than 1 year's college work in decreasing the eventual standing of those of low intelligence.

AN ATTEMPT TO PREDICT PERSISTENCE IN SCHOOL

In previous studies that have been made on prediction of scholastic success, almost none have tried to estimate how long a student will remain in school. With the guidance aim in view, the prediction of a student's persistence in school is of importance.

Using the two prognostic measures, Intelligence Test score and the Entrance Board Estimate or Summary of the High School Record, no valid predictions of persistence can be made. The Intelligence Test scores correlate 0.17 with persistence and the Entrance Board Estimate correlates 0.21 with persistence. If these two be combined so as to give the maximum correlation with persistence, a correlation of only 0.24 was secured, which is all but worthless. The prediction of length of stay in school can be improved, without doubt, by making use of other information about a student. If, however, the prediction of persistence be delayed until the end of the first quarter a much better prediction can be made by utilizing first quarter marks which correlate .40 with persistence. The addition of Intelligence Test scores and Entrance Board Estimate would probably not raise this correlation much.

Reference to Table 10 shows that many students of both low intellect and low scholarship persist for a great many quarters before dropping out; the more intelligent students of low scholarship (perhaps "sent to college") drop out about as early as the unintelligent students of low scholarship. And, as previously pointed out, not a few students of high scholarship and high intellect drop out early. Further study of persistence — investigating such factors as finances and home pressure — will need to be made before any broad generalization can be made as to its nature and conditioning factors.

ENTRANCE CONDITIONS

Of the 350 students who entered the College of Engineering 122, or 34.9 per cent of all the entrants, had entrance conditions of one amount or another. The amount of conditions ranged from ½ unit to 3½ units per student. The distribution of the number of units of conditions is shown in Table 11.

That conditions occur mainly in advanced (second year) algebra, solid geometry, physics, and foreign languages is shown by Table 12. These are the reputed "difficult" subjects of high school.

One of the first questions which we might ask is: "Does the additional burden imposed upon the student by such conditions 'affect' either his scholarship or his persistence in the University?" At first glance, it would seem that there is some relationship between the number of conditions which a student has and his scholarship (Fig. 5), which shows that those with no conditions have an average point-hour-ratio of 2.17 for the first year; those with one-half unit condition have an average point-hour-ratio of 1.92; those with one unit condition made an average point-hour-ratio of 1.88; and those with two units of conditions made an average point-hour-ratio of 1.76.

An uncritical interpretation of the relationship shown in Fig. 6 would likewise seem to indicate that amount of conditions and persistence are also negatively related, those with no conditions staying on the average about two quarters longer than those having 1 or 2 units of conditions.

These conclusions are shown to have little foundation, however, when we examine two other Figures, 7 and 8. Figure 7 indicates a very marked difference in the amount of conditions imposed upon the students of low intelligence as contrasted with those of high intelligence, four times as many of the students of low intelligence receiving conditions as of the best students.

This suggests construction of Fig. 8 to see whether those of a given degree of intellect but of varying amounts of conditions make markedly different scholarship. Although it is true that those with more than 1 condition make lower average scholarship than those with ½ to 1 condition or than those with no conditions, the difference is not great.

Therefore, the conclusion to be drawn, apparently, is that entrance conditions are entrance hurdles which serve to keep out and help eliminate early the poorer quality students who in high school avoided these reputedly more difficult subjects; and that the possession or non-possession of conditions in college *(assuming the treatment now accorded them)* is of little significance as compared with the possession or non-possession of high degrees of intellect.

One more question remains to be answered: "Do the varying amounts of conditions bear any relation to the amount of work which a student can carry acceptably?" Figure 9 shows that those without entrance conditions passed an average of about 45 hours during their first year; those with ½ unit entrance condition passed on the average about 40 hours their first year; those with 1 unit of entrance conditions passed on the average about 36 hours; and those with 2 units of entrance conditions passed an average of about 31 hours during their first year.

Of those who had graduated by June, 1927, 22.6 per cent entered with conditions. This proportion is somewhat less than 34.9 per cent, the proportion of the 350 entrants who had high-school conditions.

Conditions, then, with the treatment now accorded them. are not an alarming handicap to good work; but when coupled with low intellect, as they frequently are, may cause serious worries to the student and result in a marked diminution of college load which is successfully carried.

THE AGGREGATE EDUCATIONAL PRODUCT IN RELATION TO INTELLECT

There remains to be devised an educational index which will show clearly and distinctly the total or adequate educational product produced by students of different capacity. The two units customarily used for this purpose are the credit hour and the credit point.

Suppose, then, that one had equal numbers of students at each Intelligence Test percentile (our most valid measure of scholastic capacity). We might add the total amount of hours of credit on record at the end of each calendar quarter of students of a given percentile, likewise with credit points, as a measure of Educational product produced. However, within the Engineering College, students with differing Intelligence Test percentiles do not occur in equal numbers; it is therefore advisable to compute instead, cumulatively quarter by quarter. the *average* product produced. This average has the advantage that it can simply be multiplied by any number of students in order to secure a very close approximation to the actual total number of hours or total points respectively which will be found for that number of students on the books of the Registrar at the end of any calendar quarter chosen. On both bases, the more intelligent students greatly surpass the less intelligent students. For convenience, we may compare the relative performance of the 91 to 100 percentile students with the 1 to 10 percentile students, quarter by quarter.

Table 13 gives in column 2 and 3 the average cumulative hours credit gained by the least intelligent and the most intelligent 10 per cent of students respectively, quarter by quarter. The less intelligent students, *all considered*, have 8.2 hours on the average to their credit at the end of the first quarter; 18.7 hours at the end of the second quarter and so on. By the end of the fifteenth quarter, even the more intelligent group have only 134.4 hours to their credit, so great is the effect upon this index of those who drop out, "temporarily" and permanently. Column 4 is an index of the relative efficiency of the two groups in securing hours credit, found by dividing any entry of column 3 by the corresponding entry of column 2.

It will be seen that the more intelligent group greatly surpasses the less intelligent group, having earned in 15 quarters of work 1.71 times as many hours credit.

Columns 5 and 6 give similar figures for the average cumulative points. Column 7 gives the relative efficiency of the two groups in the attainment of points; the more intelligent groups making more marked success in this respect than the less intelligent group, inasmuch as the former do a better grade of work, take heavier loads of work, and persist longer in school. In 15 quarters the better group earned 2.29 times as many points as the poorer group. Columns 8 and 9 give the average hours credit per quarter earned in the quarter designated for the same two groups. This figure is found by subtracting successive cumulative entries of columns 2 and 3 respectively and reflects the fact that the University ceases quite early to further educate the less intelligent students, although it maintains its educational efforts reasonably well in the case of the more intelligent students. Column 10 gives the index of relative efficiency of the two groups in this respect. Columns 11 and 12 give similar figures derived in like fashion for the average points per quarter earned in the quarter designated. These figures are relative indices of both quantity and quality of work, and it will be noted that the bright students markedly surpass the dull in both respects, a fact that is even more strikingly revealed by the efficiency index or ratio of the two, given in column 13.

The facts for all of the students of all degrees of Intelligence are shown in Figures 10 and 11. One may think of the little plotting circles as representing the heads of persons looked down upon from above. Students of the differing degrees of ability are ranked in order along the southern base line at the time of entrance to the University and, at the signal at the beginning of school, start running for the northern goal post, carrying in their hands a flexible rubber tape. The successive curves are the positions of the persons and the rubber tape, as photographed at the ends of successive quarters after entrance by a long-range camera.

SUMMARY

1. Originally, 350 students entered the College of Engineering in the Autumn Quarter, 1923-24.
2. Of these, 341 students completed the first quarter's work during the Autumn Quarter, 1923-24.
3. Of the original 350, 26.6 per cent completed at least 12 quarters of work in four years; the remainder, 73.4 per cent, either dropped out or completed 11 quarters or less in that time.
4. Of the original 350, 41.1 per cent were in school and completed the work of the Spring Quarter of 1927, their "normal" graduation quarter.

5. Four years after entrance (during the Spring Quarter, 1927), of the 144 students still in attendance, 29 were advanced one quarter (had gone to school one summer in addition to regular attendance) ; 11 were advanced two quarters (two summer quarters) ; and 2 were three quarters advanced (three summer quarters) ; in all 42. There were 51 in all who were retarded from 1 to 8 quarters.

6. Only 12.8 per cent of the original 350 entrants graduated from Engineering in the four years; 27 of these 45 graduates required from 13 to 15 quarters of attendance for this purpose. The average student cannot complete the Engineering curriculum in four years of three quarters each. Graduation from the College of Engineering, in general, would apparently require the student of average intelligence to spend over five years at the University with a load, successfully carried, of 15 hours of work each quarter, exclusive of military training, physical education, and hygiene. At the rate of 18 hours of work each quarter, exclusive of military training, physical education, and hygiene, about 13 quarters would be required by such a student.*

   Table 14 shows the number of hours, exclusive of military training, physical education, and hygiene, required for the various Bachelor's degrees offered in the College of Engineering, as furnished by the Engineering College. The longest of the courses (Industrial Engineering) is 24 credit hours longer than the shortest (Engineering Physics).

7. Of the 56 (excluding one Arts-Engineering student) who in June 1927 had not received a degree and were not retarded more than one quarter, and who might therefore be expected to have ambitions toward graduation:
   (a) The average number of hours credit still to be gained is 43. They must, therefore, on the average attend at least 3 more quarters to gain the degree—14 or more in all.
   (b) Forty-one were safe as to point-hour-ratio; 15 were not.

8. Fifty-nine of the 350 entering transferred to other colleges. Of these, 4 returned ultimately to Engineering. All 59 transfers *out* took place during the first six quarters; 49 during the first year (first three quarters) and 10 more during the second

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*These estimates are surely too low for the following reasons: (1) With the succeeding years, freshman to senior, the average intellect of the survivors increases, the curriculum probably getting harder in proportion. (2) To pass successfully 15 or 18 hours, *respectively*, the average student must carry a load somewhat higher than those figures, respectively, to compensate for any work failed later; while any previous failures in prescribed subjects not yet removed in June, 1927, would virtually increase by so much the normal number of hours required for graduation.

year. Forty-six of the 59 went into either Arts (22) or C. and A. (24).

The caliber of the transferring students who graduated from other colleges is very high both as to intellect and as to scholarship. With but two exceptions—a student who graduated in 11 quarters, and entered the Graduate School for his twelfth quarter, and another who took 13 quarters——these students graduated from the other college in 12 quarters. The encouragement to go into partial graduate work during the last quarter or so of the senior year—a possibility in some of the colleges—is, apparently, all but totally lacking in the Engineering College.

9. The academic success of those having high intelligence test scores is markedly greater than the success of those having low intelligence test scores; hence the test can be used to predict academic success at the time of entrance.

   With but one exception, no student below 10-percentile intelligence has done work above the minimum quality required for graduation. Relatively few below the 50-percentile (University average) have graduated in four years, and the scholarship of these is much inferior to those above average in intellect.

10. Some 122 students (34.9 per cent) at entrance had 144 entrance conditions imposed upon them.

11. Entrance conditions were imposed primarily upon those of low intellect, and apparently the latter, rather than the conditions themselves, is the "cause" of the low scholarship and particularly low load of work (hours credited) carried acceptably by students having one or more entrance conditions. The possible incidental effects, such as worry, produced in a student of low intellect who is faced with a curriculum which the student of average intellect now completes only by 14 or more quarters of attendance is not susceptible of measurement. Further study of the problem through analysis of the curriculum to determine what prerequisites are really essential is thus indicated as desirable. Over half of the entrance conditions (77) occur in solid geometry (48) and foreign language (29), subjects which, taught as they are customarily taught in the general run of high schools, have little cultural value, less vocational value, and practically no transfer or "disciplinary" value — particularly for the prospective engineer. The conditions in algebra (26) and in physics (25) are more serious; but presumably may be removed acceptably by appropriate university courses specially designed for the purpose. The general weakness of entering students in mathematics and science concepts argues for an initial inventory period in which each student's

strengths and weaknesses as to basic skills, concepts, and knowledge, might be determined.

12. Whether measured by credit hours or by credit points the average performance, or the aggregate performance, of equal numbers of students of several different degrees of intellect are very markedly in favor of much greater educational progress for those of higher intelligence test scores. In whatever way we measure the fact, the most intelligent 10 per cent of students accomplish from 1.7 to 2.3 times as much as the least intelligent 10 per cent of students. If we were to compare the relative performance of the top 5 per cent and bottom 5 per cent, or the top 1 per cent and bottom 1 per cent, the comparative product, secured from the equal opportunities presented to both groups, would be many times as striking as the above figures. It would appear that the University is realizing only a fractional part of the educational product which might be had by a more suitable educational program for the brighter students.

TABLE 2

Basic Perseverance-Elimination Table of Engineering Students

Number of Quarters of Possible Attendance	End of Quarter		Number of Persons, Who Had Completed the Following Designated Ordinal Quarters of Work (Actual Numbers of Quarters Completed): 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Completed Work in Designated Quarter Total	%
1	1923-24	A	341															341	97.4
2		W	3	325														328	93.7
3		S		4	299													303	86.6
4		Su		1		50												51	14.6
5	1924-25	A		4	11	195	46											256	73.1
6		W			5	13	180	40										238	68.0
7		S		1	3	8	14	160	34									220	62.9
8		Su			1		2	5	14	5								27	7.7
9	1925-26	A				14	10	18	102	35	5							184	52.6
10		W				1	17	11	17	92	32	4						174	49.7
11		S			1	1	1	17	17	18	81	30	4					170	48.6
12		Su							2			13	9	2				26	7.4
13	1926-27	A		1		5		2	16	16	15	54	29	11	2			151	43.1
14		W			1		6	1	5	15	13	15	53	29	11	2		151	43.1
15		S				1		5		3	14	14	14	51	29	11	2	144	41.1
No. Who Completed the Ordinal Number of Quarters Designated			344	336	321	288	276	259	207	184	160	130	109	93	42	13	2		
Per Cent of Entrants Who Completed Ordinal Number of Quarters Designated			98.3	96.0	91.7	82.3	78.9	74.0	59.1	52.6	45.7	37.1	31.1	26.6	12.0	3.7	0.6		
Number Not Completing at Least the Ordinal Number of Quarters Designated			6	14	29	62	74	91	143	166	190	220	241	257	308	337	348		
Per Cent Not Completing at Least Number of Quarters Designated			1.7	4.0	8.3	17.7	21.1	26.0	40.9	47.4	54.3	62.9	68.9	73.4	88.0	96.3	99.4		

FIGURE 1

Persistence and Elimination of 100 Students Chosen at Random — (Percentages From the Foot of Table 1) — From the Freshman Entering College of Engineering in October, 1923, and Followed Up in June, 1927, After an Interval of 15 Quarters of Possible Attendance

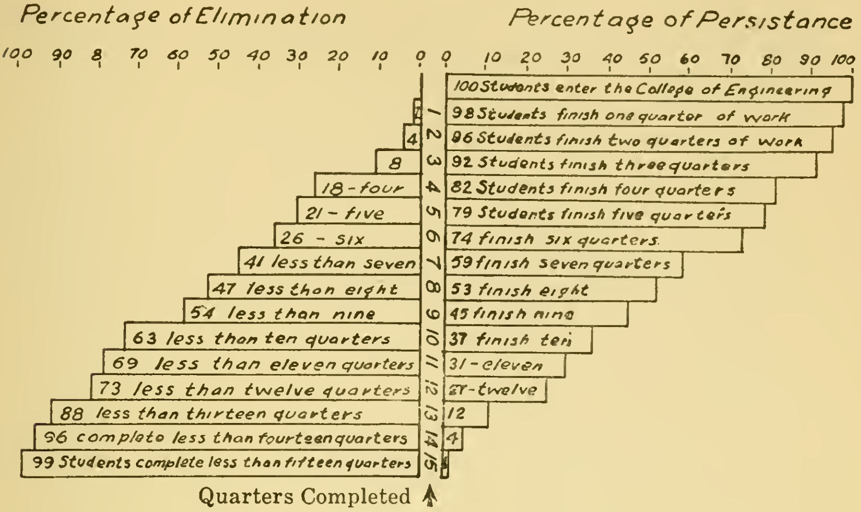


FIGURE 2

Percentage of Entrants Who Were in Attendance and Completed the Work of the Several Calendar Quarters—Autumn 1923-24 to Spring 1926-27, Inclusive, Excluding the Summer Quarters

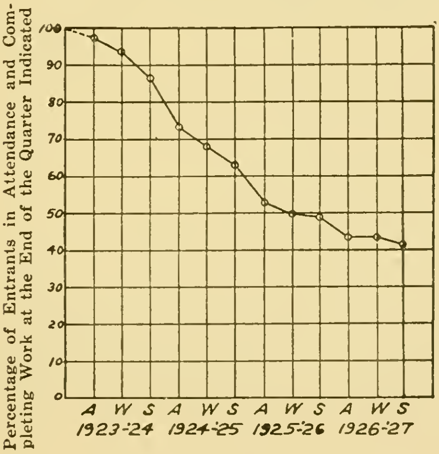


TABLE 3

NUMBER OF STUDENTS ACCELERATED OR RETARDED IN SCHOOL PROGRESS AT THE END OF ANY QUARTER

Number of Quarters Accelerated	1923-24				1924-25				1925-26				1926-27			Total
	A	W	S	Su	A	W	S	Su	A	W	S	Su	A	W	S	
+3												2	2	2	2	8
+2								5	5	4	4	9	11	11	11	60
+1				50	46	40	34	14	35	32	30	13	29	29	29	381
0	341	325	299		195	180	160	5	102	92	81		54	53	51	1938
—1		3	4	1	11	13	14	2	18	17	18		15	15	14	145
—2					4	5	8		10	11	17	2	16	13	14	100
—3							3	1	14	17	17		16	15	14	97
—4							1			1	1		2	5	3	13
—5											1			1		2
—6											1		5	6	5	17
—7													1	1	1	3
—8																
Total	341	328	303	51	256	238	220	27	184	174	170	26	151	151	144	2764

TABLE 4

Quarters Required for Degrees

College Granting Degree	Number of students receiving Degrees after the following numbers of quarters of Work in the University						Per Cent of Original 350 Entering Students Who Graduated in 4 Years
	11	12	13	14	15	Total	
Engineering		18	17	8	2	45	12.8
Agriculture		1				1	0.3
Arts	1		1			2	0.6
C. and A...........		3				3	0.8
Education		2				2	0.6
Total	1	24	18	8	2	53	15.1

TABLE 5

Credit Hours of Students Not Graduating in Four Years

Number of Credit Hours	Numbers of students who had completed the following numbers of Quarters of Work				Total
	11	12	13	14*	
230—239		1			1
220—229		2		1	3
210—219		3	3	1	7
200—209		5	3		8
190—199		6			6
180—189	2	3	2		7
170—179	6	1	2		9
160—169	1	2	1		4
150—159	1				1
140—149	2				2
130—139		1		1	2
120—129	2	2			4
110—119	2				2
Total.........	16	26	11	3	56
Average......	156.9	191.2	195.0	191.7**	182.1

* The two students who attended 15 quarters during the four years received a degree at the end of the fifteenth quarter; hence they do not appear in Tables 5, 6, and 7, which include "non-graduates" only.

** Not reliable—based on too few cases.

TABLE 6

Credit Hours to Be Gained by Students of Table 5 in Order to Graduate

Number Credit Hours to be Gained	Enrolled in the College of						Total
	Engr.	App. Optics	C. and A.	Educ.	Law	Med.	
More than enough hours	1		1				2
1–10	3		1		1		5
11–20	10	1					11
21–30	4			1			5
31–40	5						5
41–50	6						6
51–60	9						9
61–70	2		1				3
71–80	1						1
81–90	1						1
91–100	2						2
101–110	3						3
111–120	1						1
121–130							
131–140							
141–150						1	1
Total	48*	1	3	1	1	1	55

* One case has been omitted, since he is enrolled in Arts-Engineering.

TABLE 7

Cumulative Point-Hour-Ratios of Non-Graduating Students

Point-Hour-Ratio at Last Record	Numbers of Students who Completed the following Number of Quarters of Work				Total
	11	12	13	14	
3.25—3.49	1	2			3
3.00—3.24	1				1
2.75—2.99		3	1	1	5
2.50—2.74	1	2		1	4
2.25—2.49	1	5	1	1	8
2.00—2.24	2	5	4		11
1.75—1.99	1	4	4		9
....	....	....	....	....	....
1.50—1.74	6	4	1		11
1.25—1.49	2	1			3
1.00—1.24	1				1
Total	16	26	11	3	56

TABLE 8

DISTRIBUTION OF TRANSFERS

To the College of	Number of Students Who Transferred Out of the College after Completing the following numbers of quarters of Attendance in Engineering						Total
	1	2	3	4	5	6	
Agriculture	2						2
Arts	8	7	6			1	22
C. and A.	8	6	6	1	2	1	24
Education	2	1	1	1	1		6
Pharmacy	1		1				2
Applied Optics				1			1
Law				1		1	2
Total	21	14	14	4	3	3	59
Cum. Total	21	35	49	53	56	59	
Cum. Per Cent	35.6	59.3	83.0	89.8	94.9	100.0	

Seven cases made a second transfer:
1 Arts to Medicine at the end of the tenth quarter.
1 Arts to Graduate at the end of the eleventh quarter.
1 Arts to Engineering at the end of the seventh quarter.
1 Arts to Commerce at the end of the fourth quarter.
2 Commerce to Engineering at the end of the fourth quarter.
1 Education to Engineering at the end of the fourth quarter.

FIGURE 3

PER CENT OF STUDENTS ACCORDING TO INTELLIGENCE TEST SCORES WHO REMAINED IN SCHOOL AT LEAST 1 YEAR AND DID WORK OF GRADUATION MINIMUM QUALITY OR BETTER

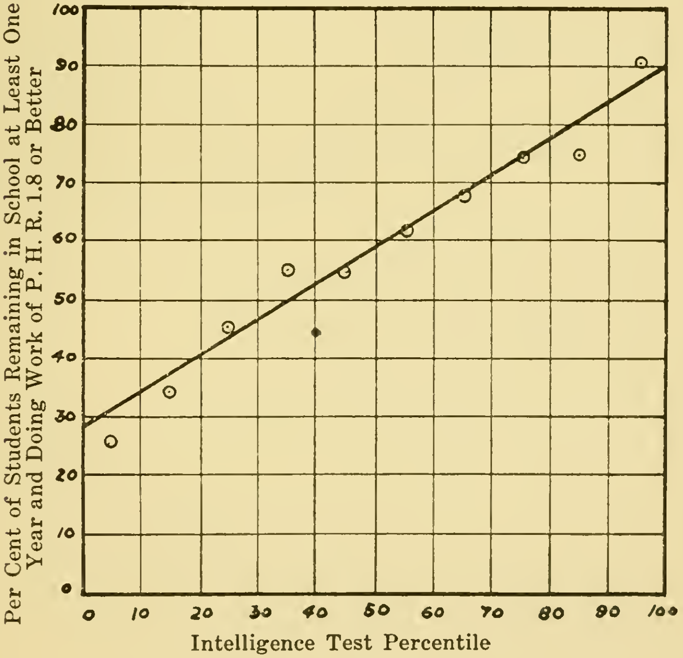


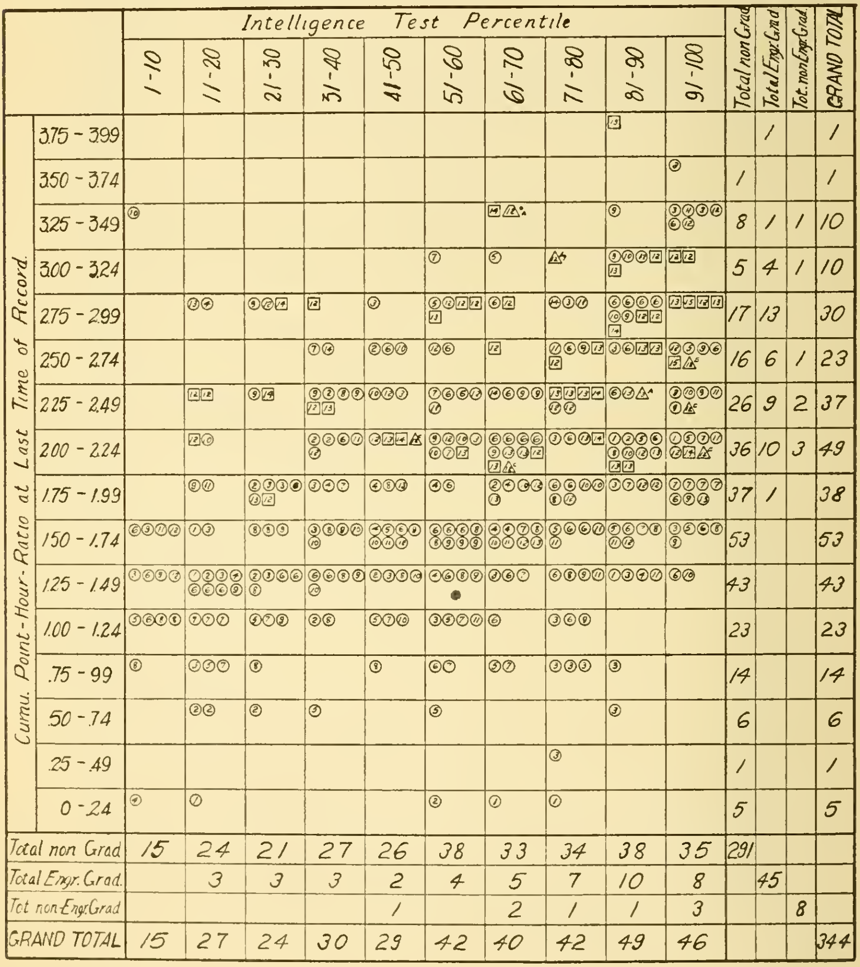
TABLE 9

COMPARISON OF FIRST QUARTER POINT-HOUR RATIOS AND INTELLIGENCE-TEST GROUPINGS

Intelligence Test		No. of Students	Per Cent of Students Receiving Point-Hour-Ratios Between the Limits of				
Intelligence Class	Corresponding Percentile		0–.99	1.00–1.99	2.00–2.99	3.00–3.99	Total
I	96–100	24	0	8	38	54	100.0
II	76–95	92	5	16	48	31	100.0
III	26–75	176	9	34	44	13	100.0
IV	6–25	44	20	48	25	7	100.0
V	1–5	8	38	25	37	0	100.0

TABLE 10

BASIC FOLLOW-UP TABLE SHOWING THE INTERRELATIONS OF INTELLIGENCE, POINT-HOUR-RATIO, QUARTERS OF PERSISTENCE, AND GRADUATION

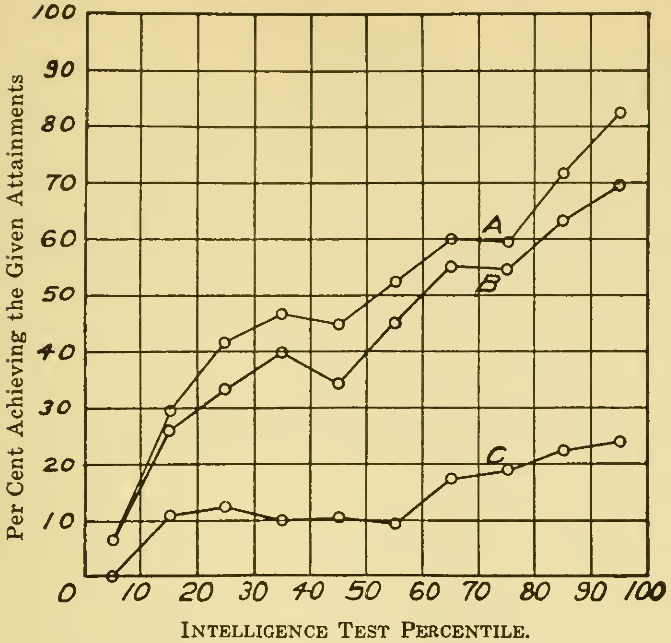


Cumu. Point-Hour-Ratio at Last Time of Record.	Intelligence Test Percentile										Total non Grad	Total Engr. Grad	Tot. non Engr. Grad	GRAND TOTAL
	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100				
3.75 - 3.99									[13]			1		1
3.50 - 3.74										②	1			1
3.25 - 3.49	⑩						[14] △12*A		⑨	③④③⑫ ⑥⑫	8	1	1	10
3.00 - 3.24						⑦	⑤	△12	⑨⑩⑬[12] [13]	[12][12]	5	4	1	10
2.75 - 2.99		⑬④	⑨⑫[14]	[12]	③	⑤⑫[12][12] [13]	⑥[12]	⑭③⑪	⑥⑥⑥⑥ ⑩⑨[12][12] [14]	[13][15][12][13]	17	13		30
2.50 - 2.74				⑦⑭	②⑥⑩	⑫⑥	[12]	⑪⑥⑨[13] [12]	③⑥[13][13]	⑫⑤⑨⑥ [15]△12E	16	6	1	23
2.25 - 2.49		[12][12]	⑨[14]	⑨②⑧⑨ [12][13]	⑩⑫③	⑦⑥⑥⑫ ⑪	⑭⑥⑨⑨	[13][13][13][14] ⑫⑫	⑥⑬△3A	⑧⑩⑨⑪ ⑨△12C	26	9	2	37
2.00 - 2.24		[12]⑩		②②⑥⑪ ⑫	⑫[13][14]△12E	⑨⑫⑩③ ⑩⑦[13]	⑥⑥⑥⑥ ⑨⑬⑬[12] [13]△12C	③⑥⑬[14]	①②⑤⑥ ⑧⑩⑫⑬ [13][13]	①⑤⑦⑪ ⑫[14]△12E	36	10	3	49
1.75 - 1.99		⑨⑪	②③③● ⑬[12]	③④⑦	④⑧⑬	④⑥	②④⑩⑫ ⑬	⑥⑥⑩⑩ ⑧⑫	③⑦⑫⑫	⑦⑦⑦⑦ ⑥⑨⑬	37	1		38
1.50 - 1.74	⑥⑨⑪⑫	①③	⑧⑧⑨	③⑧⑨⑩ ⑩	④⑤⑥⑨ ⑩⑪⑫	⑥⑥⑥⑧ ⑧⑨⑨⑨	④④⑦⑧ ⑩⑪⑫⑬	⑤⑥⑥⑪ ⑪	⑤⑥⑦⑧ ⑪⑫	③⑤⑥⑧ ⑨	53			53
1.25 - 1.49	③⑥⑨⑫	①②③④ ⑥⑥⑥⑨	②③⑥⑥ ⑧	⑥⑥⑧⑨ ⑩	②③⑧⑩	④⑥⑧⑨	③⑥⑦	⑥⑧⑨⑪	①③④⑪	⑥⑩	43			43
1.00 - 1.24	⑤⑥⑧⑧	⑦⑦⑦	⑤⑦⑨	②⑧	⑤⑦⑩	③⑤⑦⑪	⑥	③⑥⑨			23			23
.75 - .99	⑧	⑤⑤⑦	⑧		⑨	⑥⑦	⑤⑦	③③③	③		14			14
.50 - .74		②②	②	⑤		⑤			③		6			6
.25 - .49								③			1			1
0 - .24	④	①				②	①	①			5			5
Total non Grad	15	24	21	27	26	38	33	34	38	35	291			
Total Engr. Grad.		3	3	3	2	4	5	7	10	8		45		
Tot non Engr. Grad					1		2	1	1	3			8	
GRAND TOTAL	15	27	24	30	29	42	40	42	49	46				344

* Graduated in 11 quarters and spent twelfth quarter in Graduate School.

FIGURE 4

PERCENTAGE DISTRIBUTIONS OF ATTAINMENTS, ACCORDING TO INTELLIGENCE TEST PERCENTILES



A. Per cent who remained in school at least one year and whose point-hour-ratio for entire college career was above the graduation minimum.

B. Per cent who remained in school at least two years and whose point-hour-ratio for entire college career was above the graduation minimum.

C. Per cent who graduated by June, 1927.

TABLE 11

DISTRIBUTION OF 350 ENGINEERING ENTRANTS ACCORDING TO UNITS OF ENTRANCE CONDITIONS

Number of Units of Entrance Conditions	0	½	1	1½	2	2½	3	3½	Total
Number of Students	228	38	52	1	30			1	350

TABLE 12

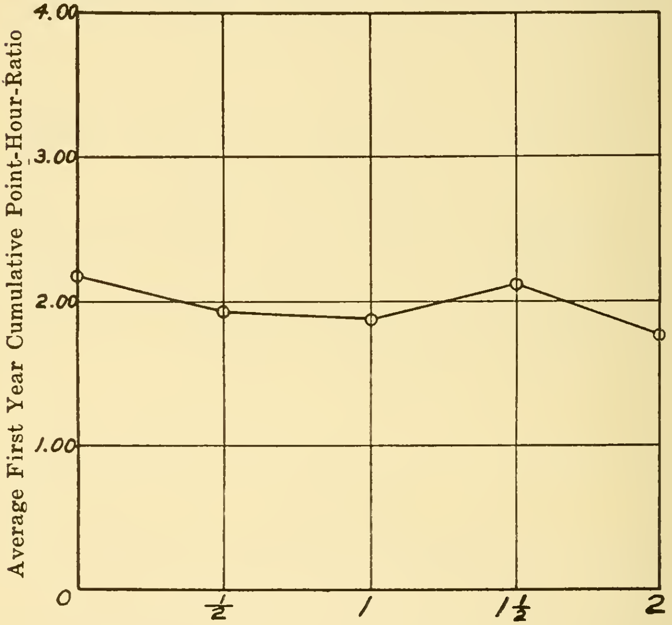
DISTRIBUTION OF ENTRANCE CONDITIONS BY HIGH-SCHOOL SUBJECTS

Subject		Students Receiving Conditions
Algebra	(½ unit)	26
Solid Geometry	(½ unit)	48
Plane Geometry	(1 unit)	2
Physics	(1 unit)	25
Foreign Language	(1 unit)	14
Foreign Language	(2 units)	29
Total		144*

* 144 is the total number of entrance conditions, by subjects, possessed by the 122 students who entered with conditions. Some of the 122 students entered with conditions in more than one subject, as shown by Table 11.

FIGURE 5

THE AVERAGE FIRST YEAR SCHOLARSHIP MADE BY 349* STUDENTS WITH VARIOUS AMOUNTS OF ENTRANCE CONDITIONS



Number of Units of Entrance Conditions

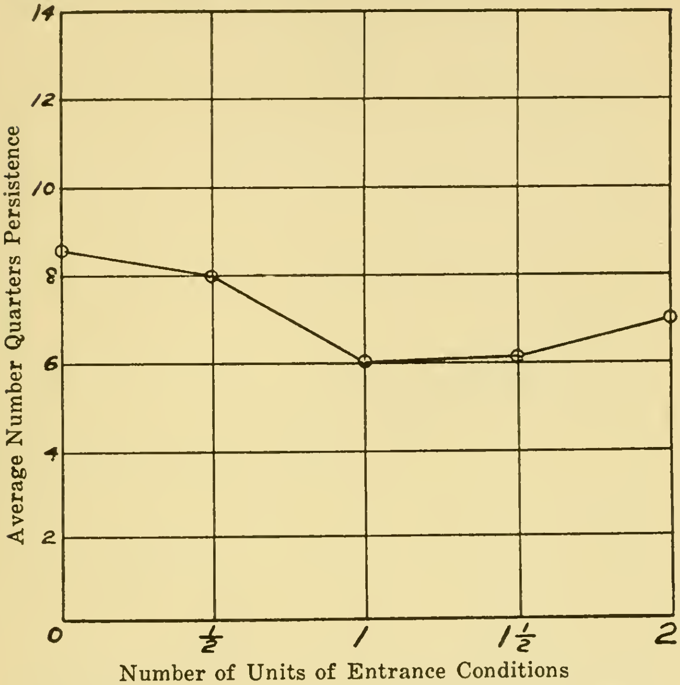
No. Cases				
228	38	52	1**	30

* One case with 3½ units entrance deficiency and 1.78 cumulative point-hour-ratio for the first year not plotted.

** Only case, plotting point therefore meaningless.

FIGURE 6

Average Persistence of 349* Students With Varying Numbers of Entrance Conditions



No. Cases—

228	38	52	1**	30

* One case with three and one-half entrance units deficiency and a persistence of 9 quarters not plotted.

** Only case, plotting point therefore meaningless.

FIGURE 7

Per Cent of Students of the Several Intelligence Percentiles Who Have One-Half or More Entrance Conditions

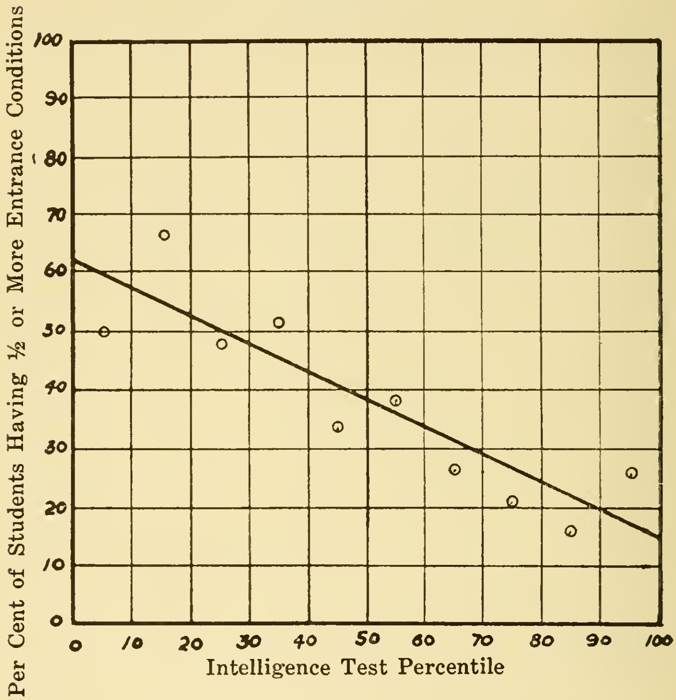


FIGURE 8

Relationship of Intelligence Test Score to Average Cumulative First Year Scholarship for Those Having Varying Numbers of Entrance Conditions

(Straight Lines are Least Square Lines of Best Fit)

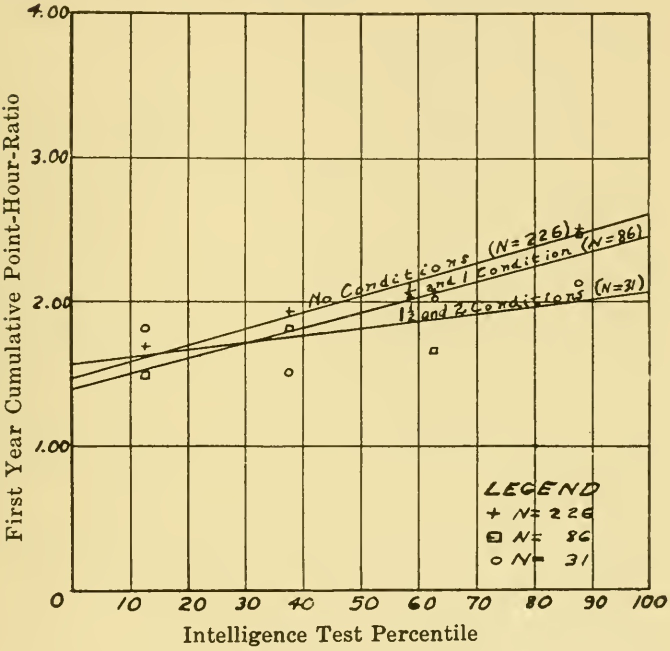
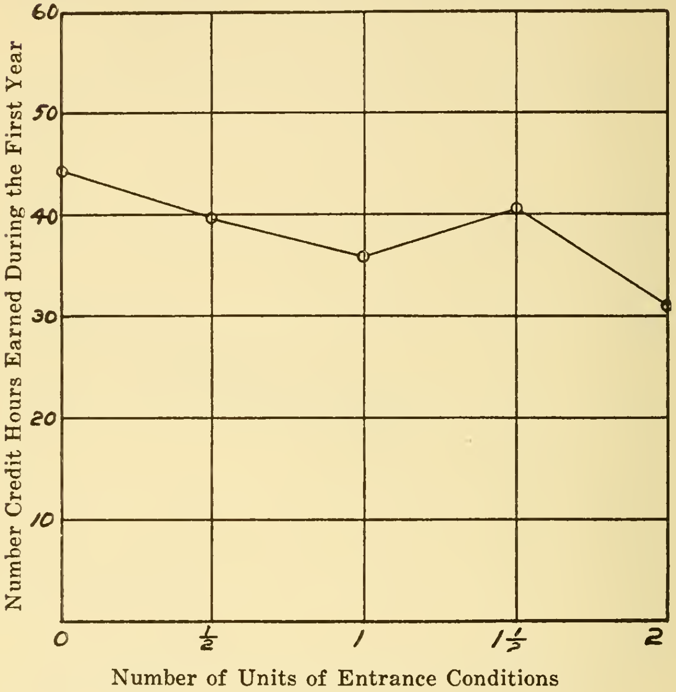


FIGURE 9

Average Number of Credit Hours Earned During Their First Year by 349* Students Having Varying Numbers of Entrance Conditions



No. Cases—

228 38 52 1** 30

* One case with three and one-half entrance units deficiency and 36 credit hours, not plotted.

** Only case, plotting point therefore meaningless.

TABLE 13

AVERAGE ATTAINMENTS OF THE 1-10 PERCENTILE STUDENTS AND THE 91-100 PERCENTILE STUDENTS

Number of Quarters of Possible Attendance	End of Calendar Quarter	Average Credit on the Registrar's Books at the End of the Quarter Designated											
		Average Cumulative Hours Credited		Relative Efficiency	Average Cumulative Points		Relative Efficiency	Average Hours Per Quarter Earned in the Quarter Designated		Relative Efficiency	Average Points Per Quarter Earned in the Quarter Designated		Relative Efficiency
		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile	
0	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1923-'24 A	8.2	16.0	1.95	14.4	47.1	3.27	8.2	16.0	1.95	14.4	47.1	3.27
2	W	18.7	32.6	1.74	34.0	92.9	2.73	10.5	16.6	1.58	19.6	45.8	2.34
3	S	29.9	47.5	1.59	50.8	132.6	2.61	11.2	14.9	1.33	16.8	39.7	2.36
4	Su	33.8	49.3	1.46	58.5	134.1	2.29	3.9	1.8	.46	7.7	1.5	.19
5	1924-'25 A	42.4	59.2	1.40	74.0	160.1	2.16	8.6	9.9	1.15	15.5	26.0	1.68
6	W	48.0	70.2	1.46	85.3	187.6	2.20	5.6	11.0	1.96	11.3	27.5	2.43
7	S	53.5	80.3	1.50	96.9	213.4	2.20	5.5	10.1	1.84	11.6	25.8	2.22
8	Su	54.0	80.9	1.50	98.1	214.6	2.19	.5	.6	1.20	1.2	1.2	1.00
9	1925-'26 A	57.1	89.7	1.57	105.6	236.3	2.24	3.1	8.8	2.84	7.5	21.7	2.89
10	W	61.9	98.3	1.59	115.2	260.1	2.26	4.8	8.6	1.79	9.6	23.8	2.48
11	S	65.5	107.3	1.64	122.0	279.5	2.29	3.6	9.0	2.50	7.0	19.4	2.77
12	Su	65.5	107.7	1.64	122.0	280.6	2.30	0.0	.4		0.0	1.1	
13	1926-'27 A	68.9	117.1	1.70	130.6	305.2	2.34	3.4	9.4	2.76	8.4	24.6	2.93
14	W	73.4	126.4	1.72	141.9	328.2	2.31	4.5	9.3	2.07	11.3	23.0	2.04
15	S	78.8	134.4	1.71	152.1	348.8	2.29	5.4	8.0	1.48	10.2	20.6	2.02

FIGURE 10

The Progress in Cumulative Hours of Equal Numbers of Students at Each Intelligence Test Score, Quarter by Quarter, for 15 Quarters

N = 350

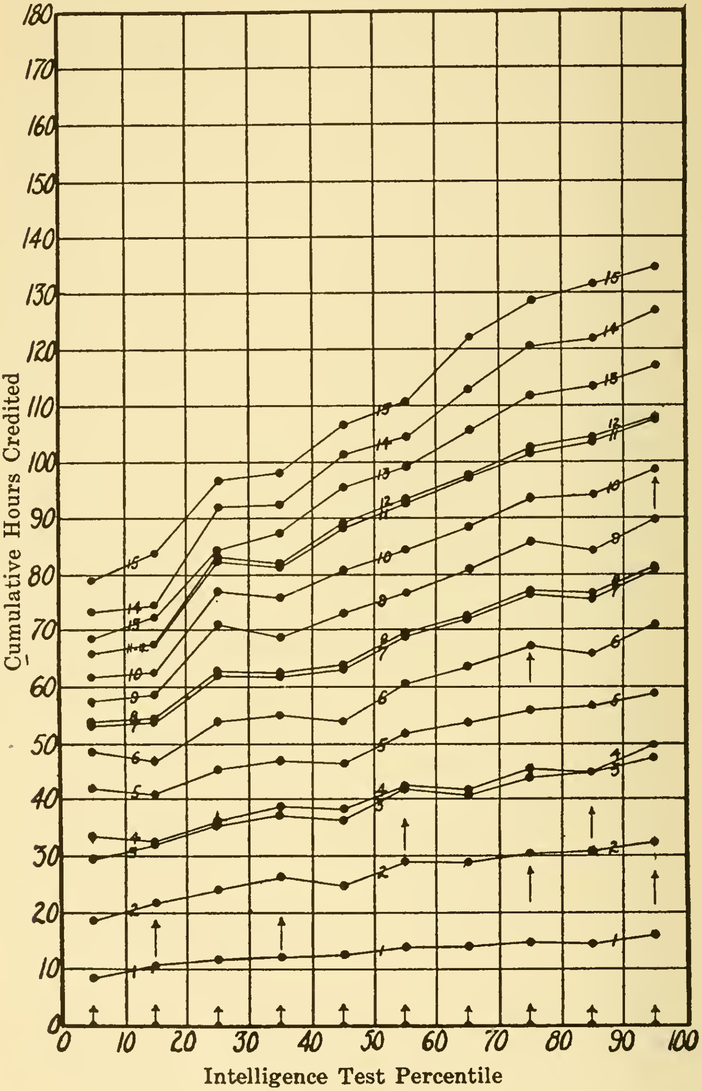


FIGURE 11

THE PROGRESS IN CUMULATIVE POINTS MADE BY EQUAL NUMBERS OF STUDENTS AT EACH INTELLIGENCE TEST SCORE, QUARTER BY QUARTER, FOR 15 QUARTERS

N = 350

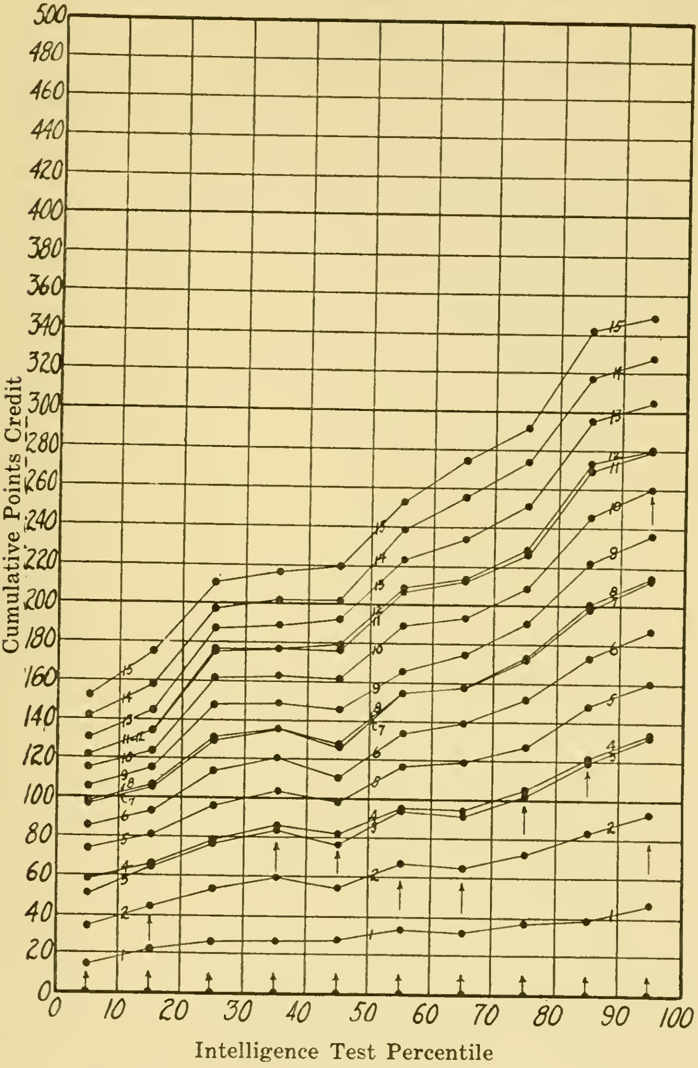


TABLE 14

Credit Hours Required for Bachelor's Degree

Course	Academic Hours Required for Degree
Architecture	225
Architectural Engineering	227
Ceramic Engineering	227
Chemical Engineering	224
Civil Engineering	230
Electrical Engineering	227
Industrial Engineering	237
Mechanical Engineering	230
Mining Engineering	226
Metallurgy	226
Engineering Physics	213
Average	226.5

CHAPTER III

THE COLLEGE OF AGRICULTURE

In the College of Agriculture, the curriculum usually chosen by the women is the Home Economics course; the curriculum for the men is either Landscaping or Agriculture. For this reason it seems proper to treat the men and women in the College of Agriculture as separate and distinct groups, for it might be said that all they have in common, academically, is the administration of the College.

FOLLOW-UP STUDY OF WOMEN

PERSISTENCE, ELIMINATION, AND GRADUATION

In Table 15 may be found the basic information concerning the academic persistence of the 88 women who entered the College of Agriculture in the Autumn Quarter, 1923. The table shows that 88 students (all who entered) completed their first quarter of work at the end of the Autumn Quarter 1923-24; 82 completed their second quarter of work at the end of the Winter Quarter, 1923-24; one completed her second quarter at the end of the Spring Quarter, 1923-24, and one at the end of the Autumn Quarter, 1924-25; in all, 84 completed at least two quarter's work. Seventy-six completed their third quarter at the end of the Spring Quarter, 1923-24; two at the end of the Autumn Quarter 1924-25; and one at the end of the Winter Quarter, 1924-25; making a total of 79 who completed at least three quarters of work. Further statistics may be read from the table.

All of the 88 who entered completed at least one quarter of work; 84 of the 88 (95.4 per cent) completed at least two quarters of work; 79 (89.8 per cent) completed at least three quarters of work, and so on. The number completing successive numbers of quarters of work decreases fairly uniformly until the thirteenth quarter. In all, 48.9 per cent completed at least twelve quarters of work and 15.9 per cent completed at least thirteen quarters of work in the four-year period. However, twelve quarters of work during the four calendar years is just normal progress (three quarters of work each calendar year).

The totals for the rows, given at the right side of the table, show the numbers who completed work during any specified calendar quarter. The table shows that 88 completed work during the Autumn Quarter, 1923-24; 82 during the Winter Quarter; 77 during the Spring Quarter, and only 7 during the Summer Quarter of the first year (1923-24). During the second year (1924-25), 68 completed work during the Autumn Quarter, 68 during the Winter, 64 during the Spring, and 7 during the Summer. In the last column of the table these totals are given in terms of per cents of the number of entrants (88). This column shows that 100 per cent completed work in the Autumn Quarter, 1923-24; 93.2 per cent in the Winter, 1923-24, and so on.

The greatest elimination is shown to be during the first year. Of the 100 per cent who entered in the Autumn of 1923, 77.3 per cent completed work during the Autumn Quarter 1924, one year after entrance; 63.6 per cent completed work during the Autumn Quarter 1925, two years after entrance; and 58.0 per cent completed work during the Autumn Quarter 1926, three years after entrance.

Those remaining in school show very little retardation. Those entries which are to the left of the diagonal are the cases that were retarded (had done less than three quarters of work each calendar year). In fact, a larger proportion of the students in school during any given quarter were accelerated (by going more than three quarters each year) than were retarded.

GRADUATION

In all, 34 of the 88 entrants (38.6 per cent) received degrees in the four-year period. One degree was granted at the end of the Winter Quarter, 1926-27, and the remaining 33 at the end of the Spring Quarter, 1926-27. Twenty-three students required 12 quarters to finish the work for a degree; 7 required 13 quarters; 3 fourteen quarters; and 1 fifteen quarters.

PROBABLE ULTIMATE GRADUATION

Fourteen of the 88 students finished at least 10 quarters of work and had not received degrees by June, 1927. Eleven of the fourteen were still enrolled in the College of Agriculture, two had transferred to Education, and one to Arts. Table 16 shows the distribution of the cumulative point-hour-ratios of these fourteen students. Only 2 of these have point-hour-ratios less than 1.8, the minimum required for graduation.

Table 17 shows the distribution of numbers of credit hours that these 14 students had yet to earn before a degree could be granted by the college in which they were last enrolled. Two cases had more than the required number of credit hours. Their point-hour-ratios were also above the minimum requirement. Eleven of the fourteen could probably graduate in one or two additional quarters of attendance. Thus perhaps 45 (or 51.2 per cent of the entrants) will probably ultimately graduate.

TRANSFERS

In all, 22 of the 88 entrants (25.0 per cent) transferred from the College of Agriculture to some other college in the University.

Three of these 22 later changed back to Agriculture. The time of transfer and the college to which the transfer was made is shown in Table 18.

ENTRANCE CONDITIONS

Of the 88 women who entered the College of Agriculture in 1923, 8 entered with conditions in one or more units of high-school work. Six had a condition of one unit of Plane Geometry; the seventh had a one-unit condition each in Plane Geometry and in Science; and the eighth had a one-unit condition in Science. Only 3 of the 8 persisted more than 3 quarters, 5 dropping out during the first year. Two of these three received degrees in Home Economics. The other persisted 12 quarters but received no degree. The average point-hour-ratio at the last time of record of the 8 students was 1.9.

PREDICTION OF SCHOLASTIC ACHIEVEMENT

Table 19 shows the scholarship of the 88 entrants at the last time of record, that is, the cumulative point-hour-ratio for the entire college course of an individual (so far as recorded during the first four years of possible attendance) in relation to the Intelligence Test percentiles. The entries of Table 19 are designated as follows:

1. Each circle, square, or triangle, represents one student.
2. A *circle* indicates that the student did not graduate during the four-year period.
3. A *square* indicates that the student graduated from the College of Agriculture.
4. A number in a *triangle* followed by a letter or letters shows that the student graduated from some college other than Agriculture. The letter or letters indicate the college granting the degree.

   A — Arts
   Ed — Education
   C — Commerce
5. The number in the circle, square or triangle indicates the number of quarters of work completed by that student.

The table shows that a rather decided relationship exists between the Intelligence Test percentile and the point-hour-ratio (the correlation being .52). If the Entrance Board's Estimate of the high-school record be added to the Intelligence Test percentile, the correlation with scholarship is raised to .61.

Table 20 shows the per cents of the entrants of the different Intelligence Test scores who received degrees. The proportion graduating bears some relation to the Intelligence Test score; a larger proportion of those having high test scores graduate than those having low scores. If the relationship between the Intelligence Test score and cumulative point-hour-ratio of only those who graduated be considered, the relation is more marked than that of the entire group. (The correlation in this case is .58). Thus, in addition to the fact that fewer having low Intelligence Test scores graduate than do those having high test scores, those having the lower Intelligence scores have even more consistently relatively lower point-hour-ratios at the time of graduation.

THE COMPOSITE COLLEGE SUCCESS OF THE GROUP IN RELATION TO INTELLIGENCE

Figure 12 shows the average cumulative credit hours of work completed by students of the several degrees of intelligence, at the end of the first, second, and other *possible* quarters of attendance during the fifteen quarters of this investigation. There is not much difference between the average credit hours at the end of successive quarters for those having even widely different percentiles. A better differentiation with respect to intelligence is found when we consider points instead of hours. Figure 13 shows the average cumulative points at the end of successive possible quarters of work.

Table 21 shows a more detailed comparison of the scholastic attainments of those of extremely low Intelligence Test scores (1-10 percentiles) and those of high Intelligence Test scores (91-100 percentiles). The relative attainments in terms of credit hours of the two groups are very similar; strangely enough, the less intelligent students doing slightly more in all quarters but the first. When the two groups are compared in terms of cumulative points, the expected superiority of the high intelligence group shows up.

In short, for the women in the College of Agriculture, the persistence is about uniform for all the different Intelligence Test scores; the amount of work done is about the same in terms of credit hours; but the quality of work (points) does vary with the size of the Intelligence Test percentile.

PREDICTION OF PERSISTENCE

Another measure of academic success is the fact of persistence. The persistence and elimination has already been discussed. The two measures usually used in predicting quality of school work bear very little relation to persistence. The Intelligence Test score shows no relationship to persistence (a correlation of .04), and the Entrance Board's Estimate of the high-school record shows only a small relationship (a correlation of .20) to persistence. If, however, we wait until one quarter has elapsed, persistence can then be predicted by the first quarter point-hour-ratio. The correlation between first quarter marks and persistence is .51. The addition of the test score or high-school record will not improve the prediction enough to pay to use either of them.

SUMMARY

1. Eighty-eight women entered the College of Agriculture in the Autumn Quarter, 1923. All completed at least one quarter of work.
2. A few more of the entrants dropped out during the first than during each of the succeeding years of the period 1923-1927.
3. Little retardation or acceleration was shown. The students went at the rate of about three quarters each year as long as they attended the University.
4. In all, 34 of the 88 entrants (38.6 per cent) received degrees by June, 1927. The records of 11 more indicate that they will probably ultimately graduate, making a total of probably 45 (51.2 per cent) of the 88 entrants who will ultimately graduate.
5. One-fourth of the entrants (22 of the 88) tranferred out of the College of Agriculture. Most of them went to Education.
6. Eight had entrance conditions in one or more units of high-school work. Seven had a one-unit condition in Plane Geometry. One of these had a condition in Science as well. The eighth had a condition in Science.
7. The Intelligence Test percentile correlated .52 with the point-hour-ratio at last time of record. The addition of the Entrance Board's Estimate of the high-school record to the Intelligence Test percentile adds very little to the correlation.
8. The average attainments of the 1-10 intelligence percentile students in terms of cumulative credit hours was better than the 91-100 percentile students. The average attainments of the 91-100 percentile students in cumulative points was considerably better than the 1-10 percentile students.
9. Larger proportions of the students who had higher test percentiles graduated than those who had low Intelligence Test percentiles.
10. Persistence shows no relationship to the Intelligence Test percentile nor to the Entrance Board's Estimate of the high-school record.
11. First quarter marks and persistence show a fairly high relationship (a correlation of .51).

FOLLOW-UP STUDY OF MEN

PERSISTENCE, ELIMINATION, AND GRADUATION

Table 22 shows the essential findings on perseverance and elimination of the 124 men who entered the College of Agriculture as freshmen in the Autumn Quarter 1923. Four completed no work, having withdrawn before the end of the first quarter. Of the 124 who entered, 120 completed their first quarter of work during the Autumn Quarter. The numbers enclosed in the boxes along the diagonal are those who made just normal progress, that is, three quarters of work each year. The cases to the left and below the diagonal are those retarded, that is, those who have done less than three quarters of work each year; and those to the right of the diagonal are those who have done more than 3 quarters of work each year, and hence are accelerated in their school progress. There is a larger proportion of retardation among the men in the College of Agriculture than in any of the other colleges studied. Of those in school during each quarter, 12.6 per cent, on the average, are retarded one or more quarters. During the first year there was only one case of retardation. That case occurred in the Spring Quarter. On the average, 14.5 per cent of the students in school were retarded during the second year; during the third year the average retardation was 18.6 per cent; and during the fourth year 17.2 per cent. Some retardation is normally to be expected in this college, since those taking an Agricultural curriculum are required to have 6 months practical farm experience, to be done during the time of a Spring and Summer quarter. The effect of the requirement of practical experience is shown quite markedly in the per cents of students completing work during the successive calendar quarters. This is shown quite clearly in Figure 14. There is a marked decrease in the proportion of students completing work during the Spring Quarter of any given year. The Summer Quarter data is not shown in Figure 14 since it is not representative of any particular trend. It is shown however, in the last two columns of Table 22 that there were only a very few of these students in school during any Summer Quarter.

The rather small percentages of students completing 9 or more quarters of work may be in part due to this retardation rather than wholly to dropping out. Or, to put it in other words, these students, if persisting as long as students in other colleges, require rather considerably more than four calendar years to graduate. Only a further follow-up of these students for an additional two or three years can answer the question. In four years, of all those who entered, 85.5 per cent completed at least three quarters of work; 63.7 per cent completed at least 6; 50.0 per cent completed at least 9; and only 18.5 per cent completed as many as 12 quarters of work.

GRADUATION

Of the 124 entrants, only 25 (20.2 per cent had graduated by June, 1927. The numbers of quarters of work completed by each graduate and the calendar quarter of graduation are shown in Table 23.

There were 29 students who completed 10 quarters or more and who had not graduated by June, 1927. The distribution of numbers of hours still to be earned before they can be granted a degree in the college in which they were last enrolled is shown in Table 24. Eleven, or possibly 13, of these could complete work for a degree in one or more quarters. By the end of two more quarters 18 of the 29 would probably have received degrees.

The distribution of the cumulative point-hour-ratio at last time of record for the 29 students is shown in Table 25. All except four of the 29 students had a point-hour-ratio above 1.8 minimum required for graduation.

TRANSFERS

Table 26 shows the tranfers made by the men who entered the College of Agriculture in the Autumn of 1923. Four of the students made a second transfer. Two of these returned to Agriculture, one transferred to Dentistry, and the fourth to Education. Seven of the 15 first transfers were to the College of Commerce. Ten of the fifteen transfers were made during the first four quarters of attendance in the University.

ENTRANCE CONDITIONS

Nine of the 124 entered with a condition in 1 or more units of high-school mathematics. Each of the nine had a condition of one unit of plane geometry and one had a unit condition of Algebra as well. The average Intelligence Test percentile of this conditioned group of 9 students was 31.7. The corresponding average for the men in Agriculture is 50.8. The average point-hour-ratio at last time of record for the nine students was 1.57. The average point-hour-ratio at last time of record of all who completed at least one quarter was 1.91. The 124 entrants had an average persistence of 7.5 quarters as compared with 5.1 for the 9 conditioned students. Thus, it is apparent that the group who have entrance conditions are in general an inferior group.

PREDICTION OF SCHOLARSHIP, PERSISTENCE, AND GRADUATION

The relationship existing between the Intelligence Test Score and the cumulative point-hour-ratio for the entire college career is shown in Table 27. There were 4 cases who had no scholarship, that is, did not complete any work in the University. The table entries are designated as follows:

1. Each circle, square, or triangle represents one student.
2. Circles represent those students who, by June 1927, had not secured a degree.
3. Squares represent those students who, by June 1927, had secured a degree from the College of Agriculture.

4. Triangles represent those students who, by June 1927, had secured a degree from colleges of Ohio State University other than the College of Agriculture. The letter C following the triangle shows that the degree was granted by the College of Commerce.
5. The number in the circle, square, or triangle, is the number of quarters of work completed by that student in the Ohio State University.
6. One student, represented by a diamond, was granted a certificate in Pharmacy after 11 quarters of University attendance.

Table 27 shows that there is a fairly high positive relationship between the Intelligence Test percentile and the cumulative point-hour-ratio. (The correlation is .54). If the Entrance Board's Estimate of the high-school record be added to the test score at an optimum weight, the correlation with the cumulative point-hour-ratio is increased to .59.

The two measures used for predicting the quality of academic work (Intelligence Test score and the Entrance Board's Estimate of the high-school record) correlated very low with persistence. The correlations are .25 and .15 respectively. If the prediction of persistence be postponed until the end of the first quarter, the first quarter point-hour-ratio may be used. It correlates better with persistence than do the two measures mentioned above. The Intelligence Test score and the Entrance Board's Estimate of the high-school record do not add appreciably to the prediction of persistence.

The 25 students (20.2 per cent) who graduated were distributed according to Intelligence Test percentile as shown in Table 28. The correlation of point-hour-ratio and Intelligence Test score of those 24 persons who received degrees is 0.36. While scholarship in terms of cumulative point-hour-ratio can be predicted quite well in the College of Agriculture, the fact of graduation in four years does not bear a large relationship to test score.

Figure 15 shows the average cumulative credit hours at the end of successive possible quarters of work, earned by students having the various Intelligence Test percentile ratings. The figure shows that in general the better the Intelligence Test score, the greater is the number of credit hours earned over a given period of time. A more detailed analysis of some of the data shown in Figure 15 is given in Table 29. The differences in attainment over a period of time of those of different Intelligence Test percentiles is shown even more strikingly in Figure 16. Figure 16 shows the average cumulative points at the end of successive possible quarters of attendance earned by students of the designated Intelligence Test percentiles.

Table 29 shows the comparison of the attainments of the 1-10 percentile students and the 91-100 percentile students. When average cumulative credit hours are considered, the ratio of the attainments of the 91-100 percentile students to the 1-10 percentile students increases from 1.46 at the end of the first quarter to 2.56 at the end of the fifteenth quarter. The ratio of average cumulative points increases from 2.64 at the end of the first quarter to 3.92 at the end of the fifteenth quarter.

SUMMARY

1. One hundred and twenty-four men entered the College of Agriculture as freshmen in the Autumn 1923.
2. One hundred and twenty of these completed at least one quarter of work.
3. There is a distinct periodicity of attendance, the per cents in school during the Spring Quarter each year during the first three years being less than the per cent during the following Autumn Quarter.
4. Retardation, due to dropping out to obtain required farm experience, is greater than in the other colleges of the University.
5. Twenty-five (20.2 per cent) had graduated by June 1927. 18 more could graduate in not more than 2 more quarters, making about 35 per cent of the entrants who will probably ultimately graduate.
6. Fifteen of the 124 entrants transferred out of the College of Agriculture. Of these 7 went to the College of Commerce. Two of the 15 later transferred back to the College of Agriculture. Over half of the transfers (8 out of 15) occurred during the first year.
7. Nine of the 124 entrants entered with one or two units of high-school mathematics entrance deficiency. Each one had one-unit condition in plane geometry and one had in addition a one unit condition in algebra. The average Intelligence Test score, the average point-hour-ratio, and the average persistence of these 9 students were noticeably below the average of the group as a whole.
8. There was a substantial relation shown between scholarship and Intelligence Test score. Those students who had low Intelligence Test scores were doing, on an average, work decidedly inferior to that of those having high test scores.

TABLE 15

Basic Perseverance-Elimination Table of Women

Number of Quarters of Possible Attendance	End of Calendar Quarter		Number of Women Who, at the End of the Quarter Specified at the Left Margin, Completed the Following Designated Ordinal Quarters of Work (Actual Number of Quarters Completed)															Completed Work in Designated Quarter	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	Per Cent
1	1923-24	A	88															88	100.0
2		W		82														82	93.2
3		S		1	76													77	87.5
4		Su				7												7	8.0
5	1924-25	A		1	2	59	6											68	77.3
6		W			1	2	59	6										68	77.3
7		S				2	2	55	5									64	72.7
8		Su						1	5	1								7	8.0
9	1925-26	A						2	44	9	1							56	63.6
10		W							2	40	7	1						50	56.8
11		S							1	3	40	7	1					52	59.1
12		Su									1	8	4	1				14	15.9
13	1926-27	A						1	1	1	2	30	11	4	1			51	58.0
14		W							1	1	1	1	28	10	4	1		47	53.4
15		S									1	1	2	28	9	4	1	46	52.3
Entrants Not Completing at Least the Ordinal Numbers of Quarters Designated	Number		88	84	79	70	67	65	59	55	53	48	46	43	14	5	1		
	Per Cent		100.0	95.4	89.8	79.5	76.1	73.9	67.0	62.5	60.2	54.5	52.3	48.9	15.9	5.7	1.1		
Entrants Not Completing at Least the Ordinal Numbers of Quarters Designated	Number		0	4	9	18	21	23	29	33	35	40	42	45	74	83	87		
	Per Cent		0.0	4.6	10.2	20.5	23.9	26.1	33.0	37.5	39.8	45.5	47.7	51.1	84.1	94.3	98.9		

TABLE 16

CUMULATIVE POINT-HOUR-RATIOS OF NON-GRADUATES

Cumulative Point-Hour-Ratio at the Time of Last Record	Number of Such Students Persisting at Least Ten Quarters
2.50–2.74	4
2.25–2.49	2
2.00–2.24	5
1.75–1.99	1
1.50–1.74	2
Total	14

TABLE 17

CREDIT HOURS STILL TO BE EARNED AFTER TEN QUARTERS

Credit Hours Yet to be Earned for Degree*	Number of Students
More than enough	2
1–10	3
11–20	5
21–30	1
31–40	
41–50	1
51–60	
61–70	1
71–80	1
Total	14

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* Provided all credit possessed is applicable toward degree sought.

TABLE 18

DISTRIBUTION OF TRANSFERS

To the College of	Number of Students Who Transferred out of the College after the following number of Quarters of Attendance in the Agriculture College							Total
	1	2	3	4	5	6	7	
Arts	2		3					5
Commerce	1	2						3
Education	3		5	2	1	1	2	14
Total	6	2	8	2	1	1	2	22
Cum. Number	6	8	16	18	19	20	22	
Cum. Per Cent	27.3	36.4	72.7	81.8	86.4	90.9	100.0	

TABLE 19

Basic Follow-Up Table Showing the Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation

Cumu. Point-Hour-Ratio At Last Time of Record.	Intelligence Test Percentile										Total non Grad	Total Agr Grad	Tot. non-Agr. Grad	GRAND TOTAL
	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100				
3.75-3.99														
3.50-3.74														
3.25-3.49						$\boxed{12}$	$\boxed{12}$					2		2
3.00-3.24		$\boxed{13}$							②	$\boxed{12}$ $\boxed{12}$	1	3		4
2.75-2.99			③			$\triangle 12^{Ed}$	$\boxed{12}$	$\boxed{13}$	$\boxed{12}$	⑨ $\boxed{12}$	2	4	1	7
2.50-2.74	$\boxed{14}$				⑪ ⑬	⑭		$\boxed{12}$ $\boxed{12}$	⑫ $\boxed{12}$	⑤	5	4		9
2.25-2.49	⑫			$\boxed{13}$	$\boxed{13}$	$\boxed{12}$	② ③ $\boxed{12}$	⑫ ⑫	④	①	7	4		11
2.00-2.24	$\boxed{12}$	$\triangle 14^{Ed}$ $\boxed{12}$	⑪ ⑪ ⑫ $\triangle 12^{Ed}$	⑥ $\boxed{13}$ ⑨ $\boxed{15}$	③ ⑦ $\boxed{13}$	⑩ $\boxed{12}$ $\triangle 12^{A}$	$\boxed{12}$				8	7	3	18
1.75-1.99	④ ⑥ ⑫ ⑬ $\boxed{12}$	② $\boxed{12}$ ⑥ $\boxed{12}$	$\boxed{13}$	⑨	$\triangle 14^{C}$ $\boxed{12}$						7	5	1	13
1.50-1.74	⑦ ⑨		③ ③ ⑨ ⑩	⑦	① ⑥						9			9
1.25-1.49	③	⑤	③ ⑧ ⑧		⑥	⑦			②	①	9			9
1.00-1.24	② ⑥	④									3			3
.75-.99		③				③					2			2
.50-.74														
.25-.49		①									1			1
.00-.24														
Total non-Grad	10	6	11	4	7	4	2	2	4	4	54			
Total Agr. Grad	3	4	1	3	3	3	4	3	2	3		29		
Tot. Non-Agr Grad		1	1		1	2							5	
GRAND TOT.	13	11	13	7	11	9	6	5	6	7				88

TABLE 20

STUDENTS OF EACH INTELLIGENCE CLASSIFICATION WHO RECEIVED DEGREES

Intelligence Test Percentile	Total Numbers of Entrants	Number Who Received Degrees	Per Cent Who Received Degrees
Column 1	Column 2	Column 3	Column 4
91—100	7	3	42.9
81—90	6	2	33.3
71—80	5	3	60.0
61—70	6	4	66.7
51—60	9	5	65.6
41—50	11	4	36.4
31—40	7	3	42.9
21—30	13	2	15.4
11—20	11	5	45.5
1—10	13	3	23.1
Total..............	88	34	38.8

FIGURE 12

The Average Progress in Cumulative Hours Made by Women Students at Each Intelligence Test Percentile, Quarter by Quarter, for 15 Successive Quarters

N = 88

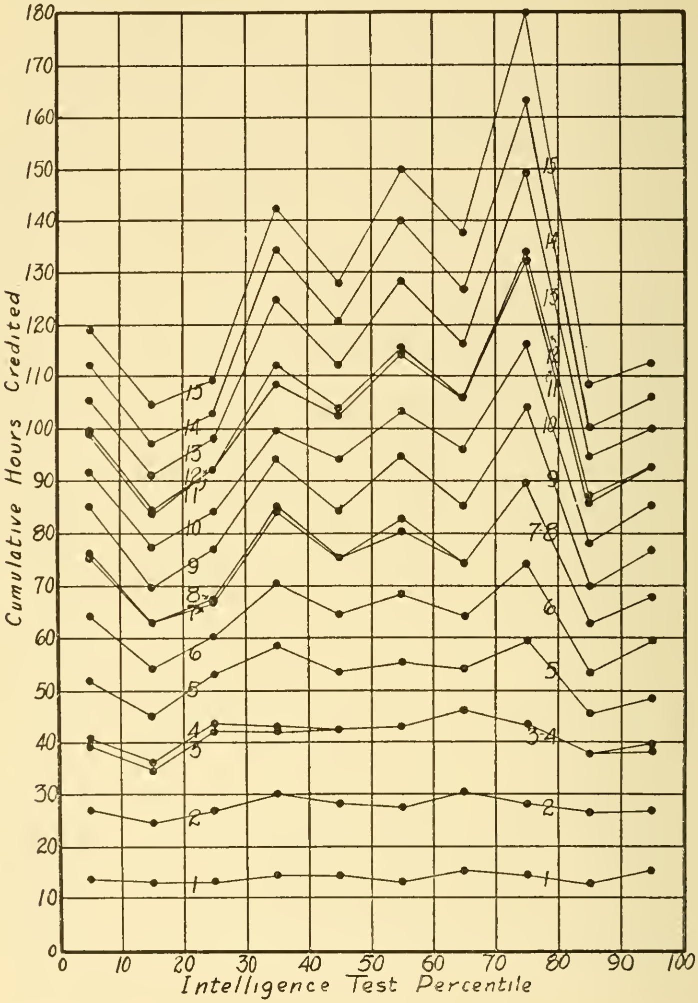


FIGURE 13

THE AVERAGE PROGRESS IN CUMULATIVE POINTS MADE BY WOMEN STUDENTS AT EACH INTELLIGENCE TEST PERCENTILE, QUARTER BY QUARTER, FOR 15 SUCCESSIVE QUARTERS

N = 88

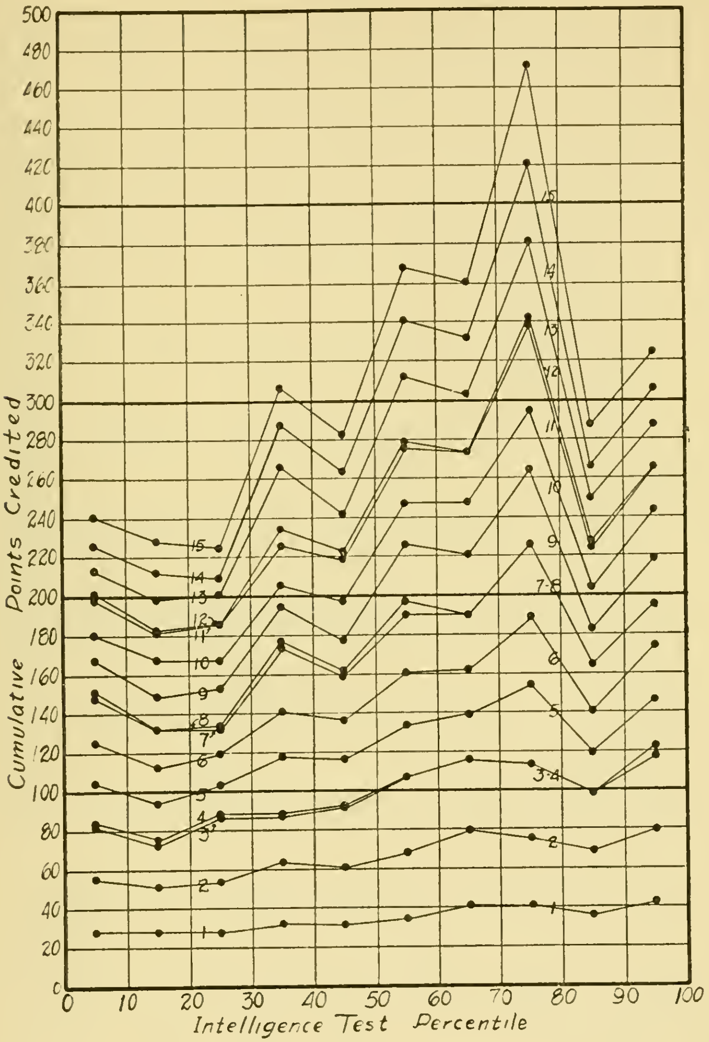


TABLE 21

AVERAGE ATTAINMENTS OF THE 1-10 PERCENTILE STUDENTS AND THE 91-100 PERCENTILE STUDENTS

Number of Quarters of Possible Attendance	End of Calendar Quarter	Average Credit on the Registrar's Books at the End of the Quarter Designated											
		Average Cumulative Hours Credited		Relative Efficiency	Average Cumulative Points		Relative Efficiency	Average Hours Per Quarter Earned in the Quarter Designated		Relative Efficiency	Average Points Per Quarter Earned in the Quarter Designated		Relative Efficiency
		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile	
0	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1923-24 A	13.7	15.4	1.12	28.1	42.7	1.52	13.7	15.4	1.12	28.1	42.7	1.52
2	W	27.2	26.8	.99	55.8	79.7	1.43	13.5	11.4	.84	27.7	37.0	1.34
3	S	39.2	38.1	.97	82.2	117.6	1.43	12.0	11.3	.94	26.4	37.9	1.44
4	Su	40.8	39.6	.97	84.1	122.6	1.46	1.6	1.5	.94	1.9	5.0	2.63
5	1924-25 A	52.8	48.3	.91	104.5	146.0	1.40	12.0	8.7	.73	20.4	23.4	1.15
6	W	64.3	59.4	.92	125.2	173.7	1.39	11.5	11.1	.97	20.7	27.7	1.34
7	S	75.2	67.7	.90	147.8	195.1	1.32	10.9	8.3	.76	22.6	21.4	.95
8	Su	76.4	67.7	.89	151.2	195.1	1.29	1.2	0	0	3.4	0	0
9	1925-26 A	85.2	76.7	.90	167.5	218.6	1.31	8.8	9.0	1.02	16.3	23.5	1.44
10	W	91.8	85.3	.93	180.2	243.3	1.35	6.6	8.6	1.30	12.7	24.7	1.94
11	S	99.2	92.7	.93	198.2	265.0	1.34	7.4	7.4	1.00	18.0	21.7	1.21
12	Su	99.8	92.7	.93	200.8	265.0	1.32	.6	0	0	2.6	0	0
13	1926-27 A	105.5	100.1	.95	212.8	287.7	1.35	5.7	7.4	1.30	12.0	22.7	1.89
14	W	112.0	106.1	.95	225.5	305.7	1.36	6.5	6.0	.92	12.7	18.0	1.42
15	S	119.1	112.5	.94	240.5	324.6	1.35	7.1	6.4	.90	15.0	18.9	1.26

TABLE 22

Basic Perseverance-Elimination Table of Men

Number of Quarters of Possible Attendance	End of Calendar Quarter		Number of Persons Who, at the End of the Quarter Specified at the Left Margin, Completed the Following Designated Ordinal Quarters of Work (Actual Number of Quarters Completed)															Completed Work in Designated Quarter	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	Per Cent
1	1923-24	A	120															120	96.8
2		W		115														115	92.7
3		S		1	82													83	66.9
4		Su			2	6												8	6.5
5	1924-25	A			19	63	6											88	71.0
6		W			2	21	59	6										88	71.0
7		S				1	11	41	4									57	46.0
8		Su						6	2	2								10	8.1
9	1925-26	A		1		2	4	18	40	4	2							71	57.3
10		W			1		2	5	20	37	4	2						71	57.3
11		S						1	1	14	33	4	2					55	44.4
12		Su								1	3	5	2					11	8.9
13	1926-27	A				1		1	4	6	11	28	6	1				58	46.8
14		W					1		1	4	7	11	26	4				54	43.5
15		S						1		1	2	4	9	18	3			38	30.6
Entrants Who Completed at Least the Ordinal Numbers of Quarters Designated	Number		120	117	106	94	83	79	72	69	62	54	45	23	3				
	Per Cent		96.8	94.4	85.5	75.8	66.9	63.7	58.1	55.6	50.0	43.5	36.3	18.5	2.4				
Entrants Not Completing at Least Ordinal Numbers of Quarters Designated	Number		4	7	18	30	41	45	52	55	62	70	79	101	121	124	124		
	Per Cent		3.2	5.6	14.5	24.2	33.1	36.3	41.9	44.4	50.0	56.5	63.7	81.5	97.6	100.0	100.0		

FIGURE 14

Percentages of 124 Entering Male Students Who Completed Work During the Calendar Quarters From Autumn 1923 to Spring 1927, Inclusive, Omitting the Summer Quarters

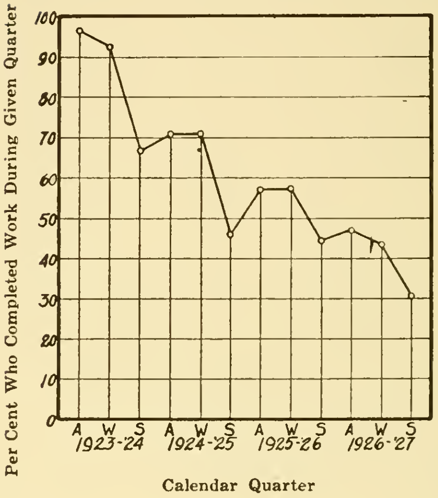


TABLE 23

Quarters of Attendance of Graduates

No. of Quarters of Attendance	Calendar Quarter of Graduation							
	1925-26				1926-27			
	A	W	S	Su	A	W	S	Total
11			2	1	2	3		8
12						1	13	14
13							2	2
Total			2	1	2	4	15	24*

* One additional student transferred to the College of Pharmacy and received a certificate at the end of his eleventh Quarter.

TABLE 24

CREDIT HOURS STILL TO BE EARNED AFTER TEN QUARTERS

Credit Hours Still to be Earned for Degree*	Number of Students
More than enough	2
1–10	7
11–20	4
21–30	5
31–40	3
41–50	4
51–60	1
61–70	1
71–80	
81–90	
91–100	
101–110	1
111–120	
121–130	1
Total	29

* Provided all credit possessed is applicable toward degree sought.

TABLE 25

CUMULATIVE POINT-HOUR-RATIOS OF STUDENTS OF TABLE 24

Cumulative Point-Hour-Ratio at Time of Last Record	Number of Students
3.75—3.99	
3.50—3.74	1
3.25—3.49	
3.00—3.24	4
2.75—2.99	1
2.50—2.74	3
2.25—2.49	6
2.00—2.24	7
1.75—1.99	4
1.50—1.74	3
Total	29

TABLE 26

Distribution of Transfers

To the College of	Number of Students Who Transferred out of the College after completing the following number of quarters of Attendance in the Agriculture College										Total
	1	2	3	4	5	6	7	8	9	10	
Arts			2								2
App. Opt				2							2
Commerce		2	3			1	1				7
Dentistry						1					1
Law						1					1
Arts—Law										1	1
Pharmacy			1								1
Total		2	6	2		3	1			1	15
Cum. Number		2	8	10	10	13	14	14	14	15	
Cum. Per Cent		13.3	53.3	66.7	66.7	86.7	93.3	93.3	93.3	100.0	

TABLE 27

BASIC FOLLOW-UP TABLE SHOWING THE INTERRELATIONS OF INTELLIGENCE, POINT-HOUR-RATIO, QUARTERS OF PERSISTENCE, AND GRADUATION (MEN)

		Intelligence Test Percentile													
		1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Total Non-Grad	Total Agr. Grad	Tot. non-Agr. Grad	GRAND TOTAL
Cumu. Point-Hour-Ratio At Last Record	375-3.99														
	3.50-3.74										④ ⑫ [12]	2	1		3
	325-349			[11]				②		⑧	[11]	2	2		4
	300-324							④	⑪	② ⑪	⑨ ⑪ ⑪	7			7
	275-299				[11]	[11]		[12]		⑪	[13]	1	4		5
	250-274		[11]		② ⑥ [11]		③ ④ ⑦ ⑨	⑥ [11]	[12]	⑨ ⑪ ⑪ [11]	⑥ ⑫ [12]	12	6		18
	225-249		③ ⑪ [12]	④ ⑩ ⑫ [12] [12]	③	④	⑩ △12	⑥ ⑫ [12]	[12]	③ ⑥ ⑩ [12]	⑩	14	6	1	21
	200-224	⑨	⑤ ⑨ ⑪	③ ⑥ [12]	⑩ ⑪ [13]	⑧	⑪ ⑪	③ ⑥ ⑧ ⑧ ⑫ [12]	① ② ⑩			19	3		22
	1.75-1.99	④ ⑨	⑧	④	[12]		⑨ ⑩	③		⑫	⑪	9	1		10
	1.50-1.74		⑬	② ⑨ ⑩	②		③ ◇11		⑩			7		1	8
	1.25-1.49		⑦	④				⑦			③	4			4
	1.00-1.24	③	⑤ ⑧	⑧	⑤	⑦ ⑤	④					8			8
	.75-.99	② ④	② ④	① ③ ②			②					8			8
	.50-.74				③							1			1
	.25 .49				②							1			1
	.0 .24														
Total non-Grad		6	12	14	9	4	12	12	5	11	10	95			
Total Agr-Grad			2	4	4	1		4	2	2	4		23		
Tot. non Agr Grad							2							2	
GRAND TOTAL		6	14	18	13	5	14	16	7	13	14				120

TABLE 28

STUDENTS OF EACH INTELLIGENCE CLASSIFICATION WHO RECEIVED DEGREES OR CERTIFICATES

Intelligence Test Percentile	Total Numbers of Entrants	Number Who Received Degrees	Per Cent Who Received Degrees
Column 1	2	3	4
91—100	15	4	26.7
81—90	13	2	15.4
71—80	7	2	28.6
61—70	16	4	25.0
51—60	14	2*	7.1
41—50	6	1	16.7
31—40	13	4	30.8
21—30	18	4	22.2
11—20	15	2	13.3
1—10	7	0	0.0
Total	124	25	19.4

* One of these students received a certificate in Pharmacy (not a degree), not counted in percentages.

FIGURE 15

THE AVERAGE PROGRESS IN CUMULATIVE HOURS MADE BY MALE STUDENTS AT EACH INTELLIGENCE TEST PERCENTILE, QUARTER BY QUARTER, FOR 15 SUCCESSIVE QUARTERS

N = 124

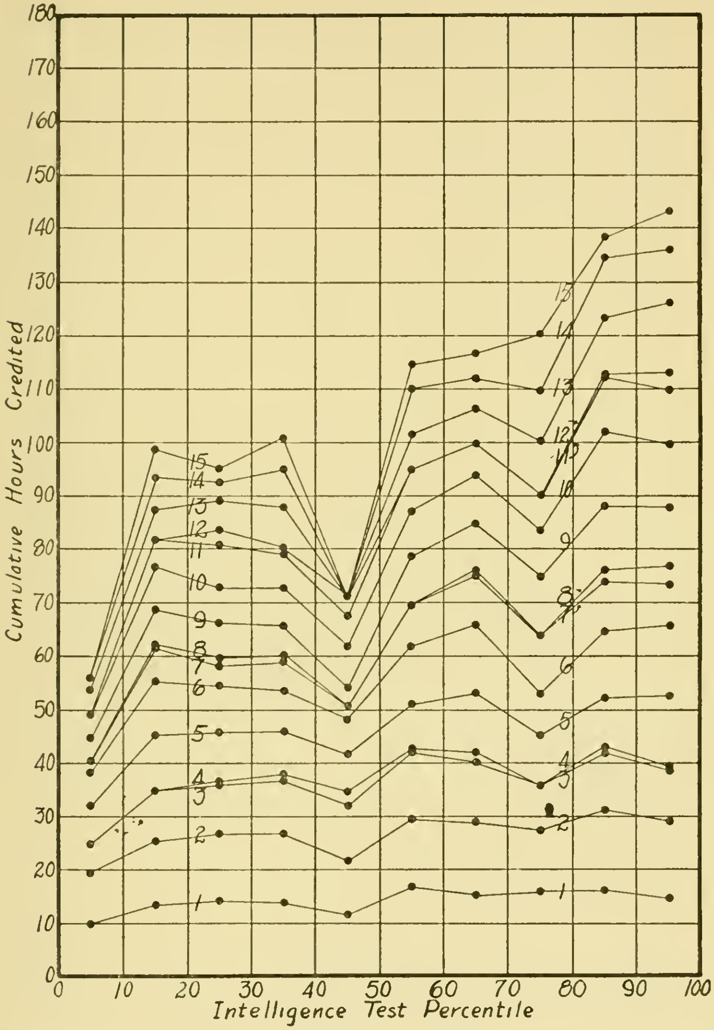


FIGURE 16

The Average Progress in Cumulative Points Made by Male Students at Each Intelligence Test Percentile, Quarter by Quarter, for 15 Successive Quarters

N = 124

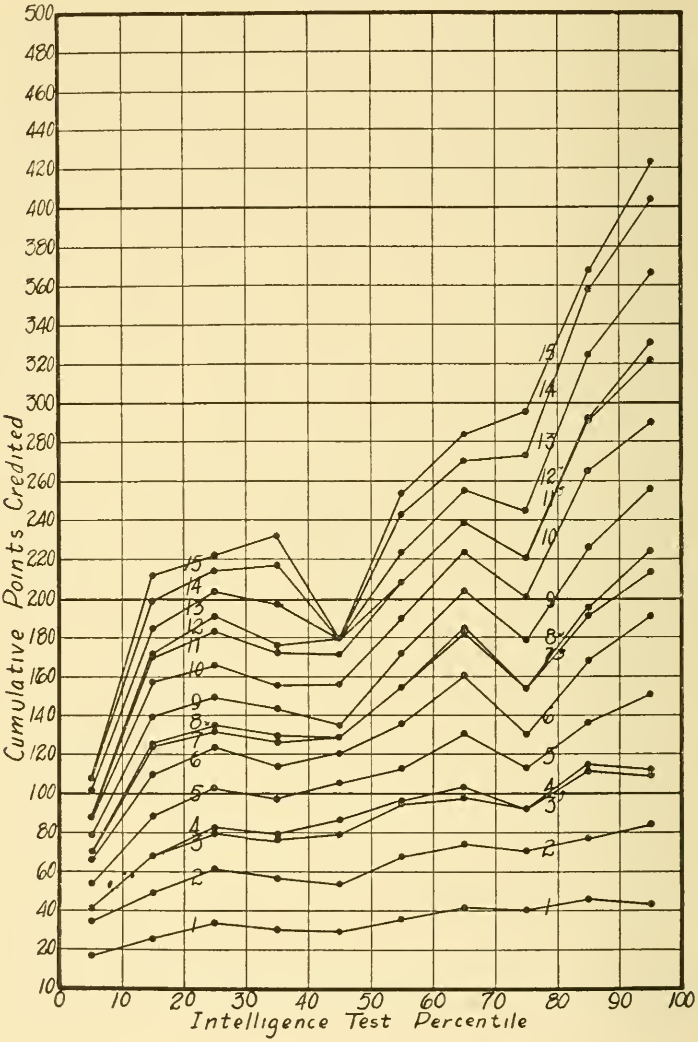


TABLE 29

AVERAGE ATTAINMENTS OF THE 1-10 PERCENTILE STUDENTS AND THE 91-100 PERCENTILE STUDENTS

Number of Quarters of Possible Attendance	End of Calendar Quarter	Average Credit on the Registrar's Books at the End of the Quarter Designated											
		Average Cumulative Hours Credited		Relative Efficiency	Average Cumulative Points		Relative Efficiency	Average Hours Per Quarter Earned in the Quarter Designated		Relative Efficiency	Average Points Per Quarter Earned in the Quarter Designated		Relative Efficiency
		1-10 Per-centile	91-100 Per-centile		1-10 Per-centile	91-100 Per-centile		1-10 Per-centile	91-100 Per-centile		1-10 Per-centile	91-100 Per-centile	
0	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1923-24 A	10.0	14.6	1.46	16.7	44.1	2.64	10.0	14.6	1.46	16.7	44.1	2.64
2	W	19.4	29.3	1.51	34.3	84.9	2.48	9.4	14.7	1.56	17.6	40.8	2.32
3	S	24.9	38.5	1.55	41.0	109.7	2.68	5.5	9.2	1.67	6.7	24.8	3.70
4	Su	24.9	39.5	1.59	41.0	112.7	2.75	0	1.0	*	0	3.0	*
5	1924-25 A	32.0	52.6	1.64	53.9	151.2	2.81	7.1	13.1	1.85	12.9	38.5	2.98
6	W	38.3	65.9	1.72	66.1	191.1	2.89	6.3	13.3	2.11	12.2	39.9	3.27
7	S	40.4	73.5	1.82	70.4	213.5	3.03	2.1	7.6	3.62	4.3	22.4	5.21
8	Su	40.4	77.1	1.91	70.4	224.1	3.18	0	3.6	*	0	10.6	*
9	1925-26 A	44.7	87.9	1.97	79.0	256.0	3.24	4.3	10.8	2.51	8.6	32.0	3.72
10	W	49.0	99.6	2.03	87.6	290.4	3.32	4.3	11.7	2.72	8.6	34.3	3.99
11	S	49.0	109.8	2.24	87.6	321.6	3.67	0	10.2	*	0	31.2	*
12	Su	49.0	113.2	2.31	87.6	330.7	3.78	0	3.4	*	0	9.1	*
13	1926-27 A	53.6	126.0	2.35	101.6	367.0	3.61	4.6	12.8	2.78	14.0	36.3	2.59
14	W	55.9	135.9	2.43	107.9	401.4	3.72	2.3	9.9	4.30	6.3	34.4	5.46
15	S	55.9	143.2	2.56	107.9	423.3	3.92	0	7.3	*	0	21.9	*

* Indeterminate Values.

CHAPTER IV

THE COLLEGE OF ARTS

It seems that it would be well to make separate studies of the men and the women who entered the College of Arts in the Autumn of 1923. This separation of the sexes should be made for several reasons:

1. The sexes entering the College of Arts have, in general, different vocational interests. These varying vocational interests lead to an early curricular differentiation in this college. The men prepare, largely, to enter the Colleges of Medicine, Dentistry, and Law. The Pre-Medical, Pre-Law, and Pre-Dental curricula are highly specialized courses. As will be shown later in this study, the women more usually have entered the Colleges of Education and Commerce for their professional training. Very few women go into Law or Medicine.
2. The data show some sex differences. The women, for example, receive the higher marks, intelligence percentile for percentile than do the men. A larger proportion of the women enter the University with conditions in one or more high-school subjects than do the men.
3. Studies of the men and of the women which have been made in a similar manner for other colleges have shown that there are some sex differences.

In view of the above, the 449 men and the 269 women who entered the College of Arts in the Autumn of 1923 will be treated as separate groups.

THE FOLLOW-UP STUDY OF MEN

PERSISTENCE, ELIMINATION, AND GRADUATION

In Table 30 may be found the basic perseverance elimination data for the 449 men entering the College of Arts. Of the 449 men, 435 completed at least one quarter of work; 14 completed no work in the University; 401 completed at least two quarters; 364 at least three quarters; and so on. During the four years of possible attendance, 81.1 per cent of the entrants completed at least three quarters of work; 56.3 per cent completed at least six quarters of work; 41.2 per cent completed at least nine quarters of work.

Let us take another view of the persistence and elimination of these students. By calendar quarters, 60.8 per cent of the entrants completed work during the Autumn Quarter, 1924, one year after entrance; 46.3 per cent completed work in the Autumn Quarter of 1925, two years after entrance; 37.4 per cent completed work during the Autumn Quarter of 1926, three years after entrance. Thus it is seen that the elimination is very rapid from the time of entrance until the beginning of the third year, but much slower during the third and fourth years (1925-26 and 1926-27).

Table 31 shows the percentages of the students in school during each calendar quarter who were retarded, who had made just normal progress, and who were accelerated (had done more than normal progress) respectively. By normal progress is meant that the student completed just three quarters of work each calender year. The number of students who made normal progress are shown by Table 30 in the boxes along the diagonal. Those numbers of students to the left and below the diagonal had completed less than three quarters of work each calendar year, and therefore were retarded in their school progress. The number of students shown to the right and above the diagonal row of boxes had completed more than three quarters each calendar year, and thus were accelerated in their school progress. Table 31 shows that there was practically no acceleration or retardation during the first year. During the second year (1924-25) the proportion in attendance who were retarded was slightly less than the proportions who were accelerated. During the Autumn Quarter of 1924-25, 5.5 per cent of those in school were retarded. Of those in school in the Autumn 1924-25, 84.2 per cent were doing their fourth quarter of work, just normal progress. Of those in school during the Autumn Quarter 1924-25, 10.3 per cent had done more than three quarters of work a year and were thus accelerated. During the third and fourth years, it is found that a slightly larger proportion of those in school were retarded than were accelerated in school progress. The difference, however, is not great. The retardation is really considerably less than one would be led to believe by a hasty inspection of Table 30.

GRADUATION

By June 1927, four years after entrance to the University, 32 of the 449 entrants had graduated. Twenty-three of these received degrees from the Arts College, six graduated from the College of Commerce, two from Education, and one from Agriculture.

This small number of graduates is hardly representative of the attainments of this group of students. As will be shown, a considerable number of these students transferred to such colleges as Law, Dentistry, and Medicine. The curricula and requirements of these colleges will not permit these students to graduate before 1928 or 1929. It might be well to see in what colleges those students who completed at least ten quarters were enrolled during their tenth quarter. Table 32 shows the distribution of the numbers of students who entered the College of Arts in the Autumn of 1923 and completed at least ten quarters of work in the University (the normal first quarter of the senior year), according to the college in which the tenth quarter of work was done.

Only forty-seven (30.1 per cent) of the 156 who completed at least ten quarters were in the College of Arts during their tenth quarter. The remainder (69.9 per cent) consisted of 6 in Agriculture, 18 in Commerce, etc., as shown by the table.

TRANSFERS

Table 33 shows the distribution of 182 transfers out of the College of Arts according to the college transferred to and the numbers of quarters of attendance in the Arts College before the transfer was made. In all, 182 students made at least one transfer, that is, 40.5 per cent of all entrants to the College of Arts made one or more transfers. Nearly half (46.7 per cent) of the transfers were completed after an attendance of three quarters or less in the Arts College (by the beginning of the student's second year in the University). By the beginning of the student's third year in the University, 72.0 per cent of the first transfers had been made. Thirteen of the 182 later transferred back to the College of Arts. Five other students made a second transfer. Five of the 18 who made a second transfer made still a third transfer. Of these five, three were from the College of Arts to the College of Law. Table 33 shows that the transfers were chiefly to the colleges of Commerce, Law, Medicine, Dentistry, and Education.

Figure 17 shows the proportions of the 449 entrants who completed at least one, two ,three, etc., quarters of work in the University. The large crosshatched area shows the proportion of students who completed their first, second, third, fourth, etc., quarters of work in the College of Arts. The small crosshatched area shows the proportion of the entrants completing their first, second, third, fourth, etc., quarters of work in some college of the Ohio State University other than the College of Arts; that is, in a transferred-to college. A greater proportion of the original Arts College entrants were doing work in some college other than the College of Arts during their seventh quarter (the beginning of their third year). From the seventh quarter on, more of the entrants who were still in school were in some other college of the University than were in the College of Arts, the college of original entrance.

ENTRANCE CONDITIONS

Thirty-three of the 449 male entrants (7.3 per cent) of the College of Arts entered the University with one-half or more units of deficiency in high-school subjects. The proportion of men who entered with conditions in high-school work was smaller than the proportion of women who entered with such conditions. The conditions are principally in mathematics, especially Plane Geometry. Those who entered with conditions were a decidedly inferior group. Their average Intelligence Test percentile was 35.0. Their average scholarship (point-hour-ratio) for their entire college course was 1.29. On the average they stayed only 4.45 quarters in the University. These figures may be compared with that of the entire group of 449 entrants which includes the 33 entering with conditions. Their average Intelligence Test percentile was 48, their average point-hour-ratio at last record for their college course was 1.81, and on the average they stayed in the University 6.86 quarters.

THE PREDICTION OF SCHOLARSHIP AND PERSISTENCE

Table 34 shows the interrelations of scholarship, Intelligence Test percentile, graduation and persistence. The table entries are designated as follows:

1. Each circle, square, or triangle represents one student.
2. A circle signifies that the student had not graduated from the University by June, 1927.
3. A square indicates that the student had graduated from the College of Arts by June, 1927.
4. A triangle indicates that the student had graduated from some college of Ohio State University other than the College of Arts by June, 1927. The letters following the triangles indicate the college granting the degree. They are as follows:
   Ag — Agriculture
   C — Commerce
   Ed — Education
5. The number in the circle, square, or triangle indicates the number of quarters that that student had completed in the University by June, 1927.

Table 34 shows that in general there is a considerable relation between the Intelligence Test percentile and the scholastic achievement of the student; the higher the Intelligence Test score, the higher the marks earned by that student, and also the lower the test score, the lower the average marks of the individual. (The correlation between Intelligence Test percentile and point-hour-ratio was .39).

From the point of view of prognosis, such a table as Table 34 may be used as an academic expectancy table. Given the student's

Intelligence Test score at entrance, one may expect him to achieve in school about the same as those students who had a like Intelligence Test score have done in the past. He is most likely to do about that work represented by the average of those having the same Intelligence Test score, and less likely to do the type of work much higher or much lower than this average attainment. The accuracy of the prediction of scholastic work may be improved by adding the Entrance Board Estimate of the high-school record to the Intelligence Test percentile. The correlation between the prognostic measures (the test score and Entrance Board Estimate of high-school record) and the cumulative point-hour-ratio at last record was .61. The relationships between the test score and academic achievement are further shown in Figures 18 and 19. Figure 18 shows the average cumulative credit hours earned by students having various Intelligence Test percentiles, for 15 successive possible quarters of school attendance. Those students who had high Intelligence Test scores completed more work than those who had low Intelligence Test scores. At the end of the first quarter the average number of credit hours possessed by a low Intelligence Test student was considerably less than the average credit hours earned up to that time by students who had high Intelligence Test scores.

Figure 19 shows the cumulative points earned during 15 successive possible quarters of attendance according to the Intelligence Test percentile of the student.

A detailed comparison of the relative attainments of the 1-10 percentile students and the 91-100 percentile students is shown in Table 35. Table 35 shows the average credit on the Registrar's books at the end of each of the calendar quarters designated. Those of high intelligence score had, on the average, from one and three-quarters to nearly two times as many credit hours at the end of the successive possible quarters of attendance as those who have low Intelligence Test scores. Those who have high Intelligence Test scores had, on the average, some two and a half to two and three-fourths times as many cumulative points at the end of successive possible quarters of attendance as do those students who earned 1-10 percentile scores on the test.

PERSISTENCE

The number of quarters which a student stays in school shows very little relationship to the Intelligence Test score and also little relationship to the Entrance Board Estimate of the high-school record. The Intelligence Test percentile correlates .32 with persistence. The Entrance Board Estimate of the high-school record correlates .31 with persistence. Combining these two measures to predict persistence would better the correlation very little. If, however, the prediction of persistence be put off until the end of the first quarter the point-hour-ratio for the first quarter may be used. This measure shows quite better correlation with persistence (the correlation is .54). Table 34 shows that no students who had point-hour-ratios less than 0.25 stayed in the University more than two quarters. None of those who had point-hour-ratios less than 0.50 stayed more than four quarters in the University. No student who had a point-hour-ratio less than 0.75 stayed more than six quarters, and no student averaging less than a "D" (point-hour-ratio 1.00) persisted more than six quarters in the University.

SUMMARY

1. There were 449 men who entered the College of Arts in the Autumn of 1923. Of these, 435 completed at least one quarter of work; and 14 completed no work in the University.
2. The elimination of the students was fairly rapid during the first two years, then slowed down. In all, 81.1 per cent completed at least three quarters of work in the University in four years. Of those who entered, 60.8 per cent were in school the Autumn Quarter one year after entrance, and only 46.3 per cent were in school during the Autumn Quarter, two years after entrance.
3. During the second year, the per cent of students in school in each quarter who were accelerated was somewhat greater than the per cent who were in school and who were retarded in their school work. During the third and fourth years, however, the proportion of those who were still in school during each calendar quarter who were retarded, was slightly greater than the proportion of those who were accelerated in their school work.
4. By June, 1927, only 32 of the 449 entrants (7.1 per cent) had graduated from the Ohio State University. Less than a third of those still in the University at the end of the tenth quarter were still enrolled in the College of Arts. The Colleges of Commerce, Law, Medicine, Dentistry, and Education, respectively in decreasing proportions had the largest numbers of the remaining two-thirds.
5. Over half of those still in school during the seventh and succeeding quarters of attendance had transferred and were doing work in some college other than Arts.
6. In all, 40.5 per cent of all of the entrants to the College of Arts transferred out of the College of Arts to some other college of the University. Nearly half (46.7 per cent) of the transfers were completed after an attendance of three quarters or less in the College of Arts. 72.0 per cent of the first transfers had been made by the beginning of the student's third year in the University.

7. Only 33 of the 449 entrants were admitted to the University with conditions in high school subjects. The conditions were principally in mathematics, especially Plane Geometry. The academic attainments of these 33 students who entered with conditions was significantly less than that of the group as a whole, both in terms of point-hour-ratio for their entire college course and their persistence in the University.
8. There was a positive relationship between the Intelligence Test percentile and the cumulative point-hour-ratio at last time of record. The correlation between these is .39. The scholarship can be better predicted if the Entrance Board's Estimate of the high school record be added to the Intelligence Test percentile. The correlation between these two measures and the point-hour-ratio was .61.
9. The Intelligence Test score and the Entrance Board's Estimate of the high school record showed only a slight relationship to the number of quarters which a student stayed in school. A fair prediction of persistence may be obtained if the prediction of persistence be put off until the end of the first quarter. If first quarter marks be used, they predict scholarship to an extent represented by a correlation of .54.

FOLLOW-UP STUDY OF THE WOMEN

PERSISTENCE, ELIMINATION, AND GRADUATION

Table 36 gives the basic data concerning the persistence and elimination of the 269 women who entered the College of Arts as freshmen in the Autumn of 1923. There are several facts shown by this table that are of interest. The totals for this table for both the columns (vertical) and the rows (horizontal), show that there is a very marked and rapid elimination of students from the University. Of the 269 who entered, only 4 did not complete any work in the University. Of the 269 who entered, 232 (86.2 per cent) completed at least three quarters of work in the University; and 62.1 per cent completed at least six quarters of work. With reference to the time of completing work, 71.0 per cent, less than three-quarters of the original entrants, completed work in the Autumn Quarter 1924, one year after entrance; only 46.8 per cent completed work during the Autumn Quarter 1925, two years after entrance; and only 38.3 per cent completed work in the Autumn of 1926, three years after entrance to the University.

Little retardation was shown by this group. In no case was the retardation greater than four quarters. In fact, after the first year (1923-24) a larger proportion of those who were in school during any quarter were accelerated (had done more than three quarters of work each year) than were retarded in their school progress.

GRADUATION

Of the 269 entrants to the College of Arts, 65 (24.2 per cent) had received a degree by June, 1927. Of these, 30 were from the College of Arts, 30 from the College of Education, and 5 from the College of Commerce.

Table 37 shows the number of quarters of work completed by each of the 65 graduates with reference to the calendar quarter in which the degree was granted. Three students graduated at the end of the eleventh quarter. One entered the graduate school and finished the twelfth quarter. The second received a degree in Education, and the third, B.A. with honors. Most of the 65 (53 of the 65) completed just 12 quarters of work before graduation. Nine required 13 quarters to earn a degree. Of the 65 graduates, 57 received degrees in June, 1927, their normal graduation quarter.

PROBABLE ULTIMATE GRADUATION

There were 43 students who had completed ten quarters or more in the University and had not, by June, 1927, graduated from any college in the University. Table 38 shows the point-hour-ratio at last time of record of the 43 students who had completed ten quarters or more and who had not graduated. Only three of the 43 had a point-hour-ratio less than 1.8, the minimum required for graduation. Table 39 shows the cumulative credit hours still to be earned before the student can graduate. It was assumed (for Table 39) that all of the hours credited are applicable toward a degree in the college in which the student was last enrolled. Probably about 16 of these students could finish with one more quarter of work; 11 more could finish by doing two more quarters of work; and 11 more upon the completion of three quarters (one year's) work. Since the point-hour-ratio of these students was sufficiently high to meet the graduation requirement, it is possible that these 38 students may ultimately graduate, making a total of 103 (38.8 per cent of the entrants) who will probably ultimately graduate.

TRANSFERS

The study of the problem of transfer from the College of Arts points out clearly the need of an active guidance program for the students in the College of Arts. The College of Liberal Arts is functioning to some extent, in the case of the men, as the "preparatory school" for the Colleges of Law, Medicine, and Dentistry.

Table 40 shows the time of transfer and the college transferred to in the case of the 102 women who transferred out of the College of Arts. These 102 women constitute 37.9 per cent of those who entered the College of Arts as freshmen in the Autumn of 1923. The table shows that very few of these transferred to the College of Law, Medicine, or Dentistry; four students transferred to Law, one transferred to Medicine, and none to the College of Dentistry. Most of those who transferred from the College of Arts went to the College of Education, in fact, 60.8 per cent of those who transferred out of Arts went to Education or Arts-Education. The College receiving the next largest number received 27.5 per cent of the transfers. This was the College of Commerce, another professional school. Most of these readjustments took place within the first two years of the student's college career. By the beginning of the student's seventh quarter in the University, 92.1 per cent of these transfers had taken place; more than half, indeed, by the beginning of the fourth quarter. Figure 20 gives us a more detailed picture of what happened to those who entered the College of Arts with reference to their transfer to other colleges. The large crosshatched area shows the proportions of the original entrants who, at the end of the quarter shown at the bottom of the graph, were still in the College of Arts. The small crosshatched area gives the proportions of students who entered the College of Arts in the Autumn of 1923, and who were still in the University at the quarter specified along the base line but who were doing work in some college other than the College of Arts. As early as the seventh quarter, a larger proportion of those still in school were doing their University work in some other college than the College of Arts. The white space above the crosshatched areas represents the proportions of students who have dropped out of the University.

ENTRANCE CONDITIONS

Of the 269 women who entered in the College of Arts, 22 had entrance conditions in some high-school subject. Almost all of these conditions were in high-school mathematics, plane geometry, or algebra. These 22 students were in all respects inferior to the group as a whole. The average Intelligence Test percentile of those who had conditions was 42. Their average point-hour-ratio at last time of record was 1.66, and the average persistence was 4.45 quarters. These figures may be compared to those for the entire group, which includes these 22 cases. The average Intelligence Test percentile of the entire group was 49; the average point-hour-ratio at last time of record was 2.04; and the persistence was on the average, 7.39 quarters.

THE PREDICTION OF PERSISTENCE, SCHOLARSHIP, AND GRADUATION

In Table 41 are shown the interrelations of the Intelligence Test percentile, the cumulative point-hour-ratio at last time of record, the number of quarters of persistence in the University, and graduation. The table entries are designated as follows:

1. Each student is represented in the table by a circle, square or a triangle.
2. A circle means that the student had not graduated from the University by June, 1927.
3. A square means that the student had graduated from the College of Arts by June, 1927.
4. A triangle followed by a letter, or letters, shows that the student had graduated from the University but from some college other than the College of Arts. The letter or letters following the triangle designate the college from which the student graduated:
   C — Commerce
   Ed — Education
5. The numbers in the circles, squares, and triangles show the number of quarters that the student had completed in the Ohio State University.

There is a fair relationship between the point-hour-ratio and the Intelligence Test percentile (the correlation is .43). The scholarship at last time of record can be better estimated if the Entrance Board's Estimate of the high-school record be added to the test score. This raises the correlation to .54.

Figure 21 shows the relationship between the average cumulative hours credited at the end of successive possible quarters of attendance at the University for students who have different Intelligence Test percentiles. The attainment of the students between the seventieth and eightieth percentile is greater than that of any other group. Aside from this particular discrepancy, the higher the Intelligence Test percentile the greater the average number of cumulative hours credited at the end of any given quarter of attendance in the University.

Figure 22 shows the relationship between the average cumulative points credited and the Intelligence Test percentile. The graph shows about the same trend as does Figure 21. This is, however, a more regular trend upward, in terms of cumulative points credited, from low Intelligence Test percentiles toward high Intelligence Test percentiles.

A more detailed comparison of the relative attainments of the lowest decile students (1-10 percentile) and the highest decile (91-100 percentile) students is shown in Table 42. The relative efficiency of the two groups is shown by the ratio of the attainments of the 91-100 percentile group to the 1-10 percentile group. The average cumulative credit hours of the upper group are ranged approximately from about 1.25 to 1.43 times the average cumulative credit hours of the 1-10 percentile group. The relative attainments in terms of cumulative points range from 1.76 to 1.96.

THE PREDICTION OF GRADUATION

The totals of the columns of Table 41 show us that in general a larger proportion of those students who who have high Intelligence Test percentiles graduate than do those who have low Intelligence Test percentiles. Figure 23 shows the percentages of students, according to the Intelligence Test percentile, who had graduated by June, 1927. This figure may be used as a means of determining the probability of graduation as depending upon the Intelligence Test percentile. A straight line has been fitted to the data shown on the graph and this may be used as the curve showing the probability of graduation. If X be the Intelligence Test percentile and Y the number of chances in 100 of graduation within four years after entrance, the chances for graduation for a student having any given percentile may be shown by the equation

$$Y = .251X + 11.63$$

Thus, for a student who has a 10-percentile score on the test, the chances of graduation are about 14 in 100; for a 50-percentile student, the chances are about 24 in 100; and for a 90-percentile student the chances are approximately 34 in 100.

PREDICTION OF PERSISTENCE

The number of quarters which a student persists in school bears little relation to the Intelligence Test percentile (a correlation of .13). Persistence shows a somewhat higher correlation with the Entrance Board's Estimate of the high-school record (a correlation of .33). If the Intelligence Test percentile and the Entrance Board's Estimate of the high-school record were combined to predict persistence, the correlation would be only slightly higher than .33. If, however, one waits until the end of the first quarter, the first quarter marks could be used to predict the length of stay in the University. The first quarter point-hour-ratio correlates .44 with the persistence.

SUMMARY

1. In Autumn of 1923, 269 women entered the College of Arts as freshmen. Of these 269, four did not complete as much as one quarter of work in the University. The elimination rate for this group was fairly rapid at first, but slowed down after the beginning of the second year.
2. Little retardation was shown by this group. In no case was retardation greater than four quarters. After the end of the first year, a larger proportion of those who were in school during

any quarter were accelerated than were retarded in their school progress.

3. By June, 1927, only 65 (24.2 per cent) of the 269 entrants had graduated from the University. Thirty of these graduated from the College of Arts. Three of the graduates completed their work in 11 quarters.
4. Thirty-eight students who had not graduated had sufficiently high point-hour-ratios and enough work already completed so that it is quite probable that they will ultimately graduate from the University, which makes the total of probable ultimate graduates 103 (38.3 per cent of the 269 entrants).
5. Of the 269 entrants to the College of Arts, 37.9 per cent transferred to some other college of the University. Nearly half of these transfers were to the College of Education. Approximately a fourth of the transfers were to the College of Commerce. Over half of the transfers had taken place by the end of the student's fourth quarter in the University.
6. Only 22 of the 269 entrants (8.2 per cent) had conditions in some high-school subject at time of entrance. Practically all of these entrance conditions were in high-school mathematics, chiefly plane geometry. These 22 students constitute in all respects an inferior group.
7. There is a fair relationship between the point-hour-ratio at last time of record and the Intelligence Test percentile (a correlation of .43). The scholarship at last time of record can be better estimated if the Entrance Board Estimate of the high-school record be added to the Intelligence Test percentile. This procedure raised the correlation with scholarship to .54. The average cumulative credit hours at the end of successive quarters of attendance in the University for the 91-100 percentile Intelligence Test group ranged from about 1.25 to 1.43 times the average cumulative credit hours of the 1-10 percentile group. The relative attainments in terms of the cumulative points for these two groups varied from 1.76 to 1.96.
8. A larger proportion of the students who had high Intelligence Test percentiles graduated than did those who had low Intelligence Test percentiles. A curve has been drawn showing the probability of graduation as dependent upon the Intelligence Test percentile.

TABLE 30

Basic Perseverance-Elimination Table of Men

Number of Quarters of Possible Attendance	End of Calendar Quarter		Number of Men Who, at the End of the Quarter Specified at the Left Margin, Completed the Following Designated Ordinal Quarters of Work (Actual Number of Quarters Completed)															Completed Work in Designated Quarter	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	Per Cent
1	1923-24	A	433															433	96.4
2		W		388														388	86.4
3		S		6	345													351	78.2
4		Su			3	31												34	7.6
5	1924-25	A	2	4	9	230	28											273	60.8
6		W		2	2	15	206	26										251	55.9
7		S			2	9	21	182	24									238	53.0
8		Su						3	19	6								28	6.2
9	1925-26	A		1	2	13	7	18	130	31	6							208	46.3
10		W			1	3	13	8	20	126	25	5						201	44.8
11		S				1	3	9	7	14	120	21	5					180	40.1
12		Su									3	14	3	1				21	4.7
13	1926-27	A				1	3	3	10	9	11	96	27	7	1			168	37.4
14		W					3	2	3	8	12	11	92	25	6	1		163	36.3
15		Su						2	1	3	8	9	8	83	23	6	1	144	32.1
Entrants Who Completed at Least the Ordinal Numbers of Quarters Designated	Number		435	401	364	303	284	253	214	197	185	156	135	116	30	7	1		
	Per Cent		96.9	89.3	81.1	67.5	63.3	56.3	47.7	43.9	41.2	34.7	30.1	25.8	6.7	1.6	.2		
Entrants Not Completing at Least the Ordinal Numbers of Quarters Designated	Number		14	48	85	146	165	196	235	252	264	293	314	333	419	442	448		
	Per Cent		3.1	10.7	18.9	32.5	36.7	43.7	52.3	56.1	58.8	65.3	69.9	74.2	93.3	98.4	99.8		

TABLE 31

RATE OF PROGRESS OF STUDENTS

Calendar Quarter of Attendance		Per Cent Retarded	Per Cent Doing Just 3 Quarters Each Year	Per Cent Accelerated
1923-24	Autumn	0	100	0
	Winter	0	100	0
	Spring	1.7	98.3	0
1924-25	Autumn	5.5	84.2	10.3
	Winter	7.6	82.1	10.3
	Spring	13.4	76.5	10.1
1925-26	Autumn	19.7	62.5	17.8
	Winter	22.4	62.7	14.9
	Spring	18.9	66.7	14.4
1926-27	Autumn	22.0	57.2	20.8
	Winter	23.9	56.5	19.6
	Spring	21.5	57.7	20.8

TABLE 32

DISTRIBUTION OF ENTRANTS WHO COMPLETED AT LEAST 10 QUARTERS

College in Which Tenth Quarter's Work Was Done	No. Enrolled
Arts	47
Agriculture	6
Commerce	18
Engineering	7
Dentistry	19
Law	20
Medicine	13
Education	7
Arts—Medicine	1
Arts—Law	7
Arts—Education	7
Science—Medicine	3
Applied Optics	1
Total Completing Ten Quarters	156

TABLE 33

Distribution of Transfers (Men)

To the College of	Number of Students who Transferred out of the College after Completing the following number of Quarters of Attendance in the College of Arts											
	1	2	3	4	5	6	7	8	9	10	11	Total
Agriculture	4	2		1		2						9
Applied Optics						1					1	2
Commerce	13	13	15	6	4	2	3					56
Education	1	1	4	1		2	1	2	1			13
Engineering	5	2	6		1	1						15
Pharmacy		1	1	2								4
Arts—Education	2		3	1	1		2					9
Arts—Law									7			7
Arts—Medicine									1	1		2
Science—Medicine							3					3
Dentistry			12	5	2	2	1					22
Law						7	3		8	1	1	20
Medicine						5	2	1	7	4		19
Graduate											1	1
Total	25	19	41	16	8	22	15	3	24	6	3	182
Cumulative Total	25	44	85	101	109	131	146	149	173	179	182	
Cumulative Per Cent	13.7	24.2	46.7	55.5	59.9	72.0	80.2	81.9	95.1	98.4	100.0	

FIGURE 17

Graph Showing the Extent of Retention of the Original 449 Male Entrants, in Relation to Numbers of Quarters of Attendance in the Arts College (Large Cross-Hatched Area Under Curve A); in Other Colleges of Ohio State University (Small Cross-Hatched Area, Between Curves A and B); and in Both, All the Area Under Curve B

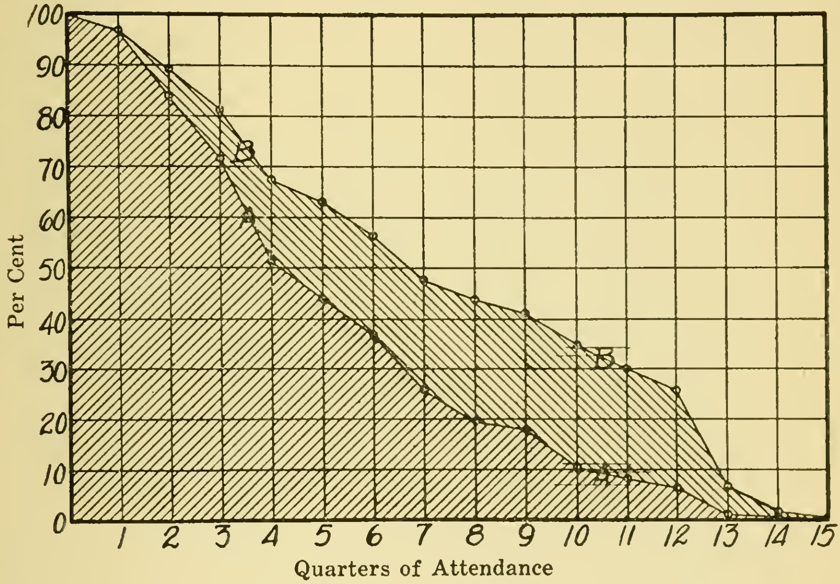


TABLE 34

Basic Follow-Up Table Showing the Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation (Men)

		Intelligence Test Percentile										Total non-Grad	Total Arts Grad	Tot non-Arts Grad	GRAND TOTAL
		1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100				
Cumu Point Hour Ratio at Lost Time of Record	3.75 - 3.99										③ $\boxed{10}$ $\boxed{12}$	1	2		3
	3.50 - 3.74					⑫ $\boxed{12}$		⑩ $\boxed{12}$	$\boxed{12}$	⑫	⑥ $\boxed{12}$	4	4		8
	3.25 - 3.49				③		$\boxed{12}$ $\boxed{15}$	$\boxed{13}$		$\boxed{12}$	① $\boxed{12}$ ⑫⑫	4	5		9
	3.00 - 3.24	⑫		$\boxed{12}$	⑪ △12			⑤⑫ $\boxed{12}$		⑥ $\boxed{12}$ ⑫ $\boxed{12}$	⑪	7	4	1	12
	2.75 - 2.99			△11	③⑭	⑩ △11	⑫		③⑫	⑨⑨ ⑫⑮⑮	③③⑥	14		2	16
	2.50 - 2.74		⑦⑫	⑩	③⑨ ⑨⑬	$\boxed{13}$	$\boxed{12}$	⑨ $\boxed{12}$ ⑫⑬		③⑫⑫	⑦ △12 ⑩⑫⑫	17	3	1	21
	2.25 - 2.49	③⑫⑭	⑨ △12 ⑫⑫⑫	③⑨ ⑪⑫⑫	③ △12 ⑪⑪⑫	⑫⑫⑮	③ $\boxed{12}$ ③⑨⑨ ⑫⑫⑮	③⑫ ⑫⑫	⑪⑫⑫ ⑫⑫⑬	⑫⑬ △12 ⑮	⑥ $\boxed{12}$ ⑫⑬	42	2	3	47
	2.00 - 2.24	⑫⑬ ⑬⑮	②⑨° ⑩⑫⑫	③ $\boxed{12}$	① $\boxed{12}$ ③⑩⑫	④ $\boxed{13}$ ⑨⑫⑫	⑨⑨ ⑬⑬	③⑤ ⑥⑨	③ △13 ④⑫	②⑥⑥ ⑦⑫⑭	④⑫	37	3	1	41
	1.75 - 1.99	①⑤⑤ ⑥⑫⑬	⑦⑧ ⑩⑫	③⑤ ⑦⑩	②③③ ⑩⑪ ⑫⑫⑬	③⑨ ⑬⑭	②②⑥ △12 ⑧⑨⑫ ⑫⑫⑫⑭	⑩⑩ ⑫⑫⑬	①③ ④④⑪ ⑪⑪	⑥⑩ ⑫⑫⑫ ⑫	⑩⑪	56		1	57
	1.50 - 1.74	①③ ⑥⑥⑦	③③ ⑥⑫⑫	⑧⑨⑩	①③③ ⑥⑦⑦⑧ ⑨⑪⑫	③⑦⑧	③⑦ ⑪⑫	③⑩ ⑩⑪	⑥⑥ ⑨⑨⑩ ⑪⑪	②④⑥ ⑨⑨ ⑩⑩⑩	①③⑤ ⑤⑥ ⑥⑦⑪	57			57
	1.25 - 1.49	②③③ ⑧⑧ ⑥⑥⑨	③⑤ ⑥⑦⑧	①①③ ⑧⑧⑨	①② ⑤⑤⑥ ⑦⑨	③⑤ ⑤⑨	③③⑨	⑤⑥⑥	③④ ④⑤	③③⑤	④⑤⑥	46			46
	1.00 1.24	①②⑤ ⑤⑤⑥ ⑦⑦⑨	①③⑥	③③⑤ ⑤⑥⑧	①⑥ ⑥⑧⑨	③④ ⑥⑦	②④ ⑤⑥⑥	①③⑤	③③⑥		②⑤ ⑥⑦	42			42
	75 - 99	①②③ ③③⑥	②②③	③	②③ ④④	④⑤ ⑤⑥	③⑤ ⑤⑤	⑥		②②③		26			26
	50 - .74	②⑤	②②③	②④⑤	②② ③④⑤		①①		①④			17			17
	.25 - .49	③	②②②	①① ②④		①②				③		11			11
	0 - .24	①①①① ①①① ①②②②	①①②	②②	①	①① ②②				②		22			22
Total non-Grad		56	40	36	56	34	40	30	34	42	35	403			
Total Arts Grad				2	1	3	4	4	1	3	5		23		
Tot non-Arts Grad			1	1	2	1	1		1	1	1			9	
GRAND TOTAL		56	41	39	59	38	45	34	36	46	41				435

FIGURE 18

The Average Progress in Cumulative Hours Made by Male Students at Each Intelligence Test Percentile, Quarter by Quarter, for 15 Successive Quarters

N = 449

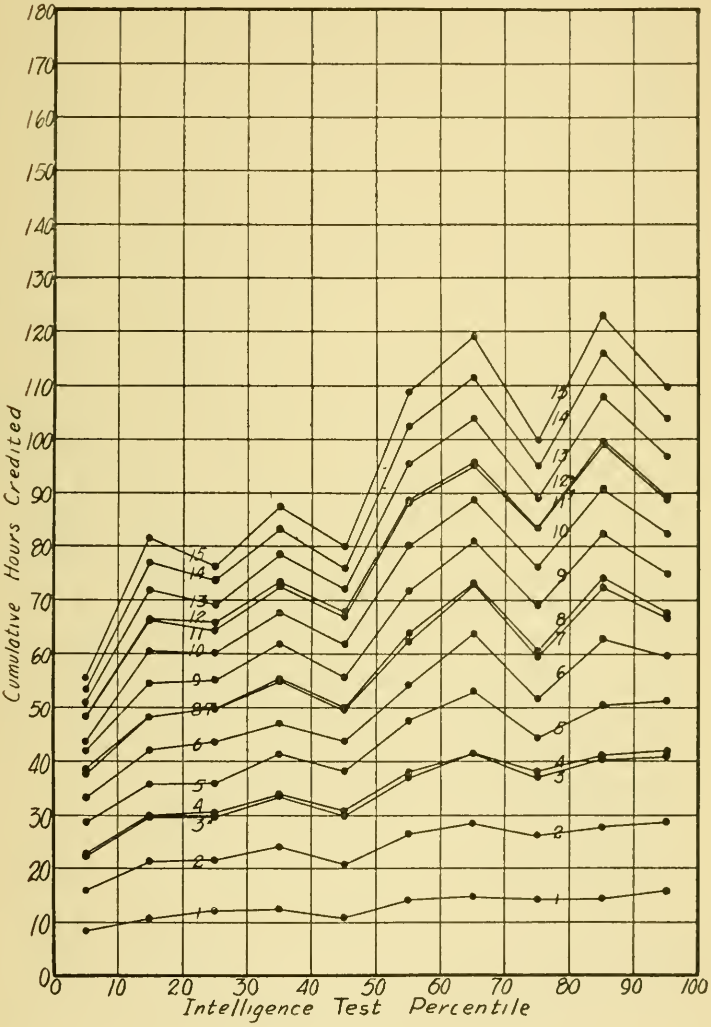


FIGURE 19

THE AVERAGE PROGRESS IN CUMULATIVE POINTS MADE BY MALE STUDENTS AT EACH INTELLIGENCE TEST PERCENTILE, QUARTER BY QUARTER FOR 15 SUCCESSIVE QUARTERS

N = 449

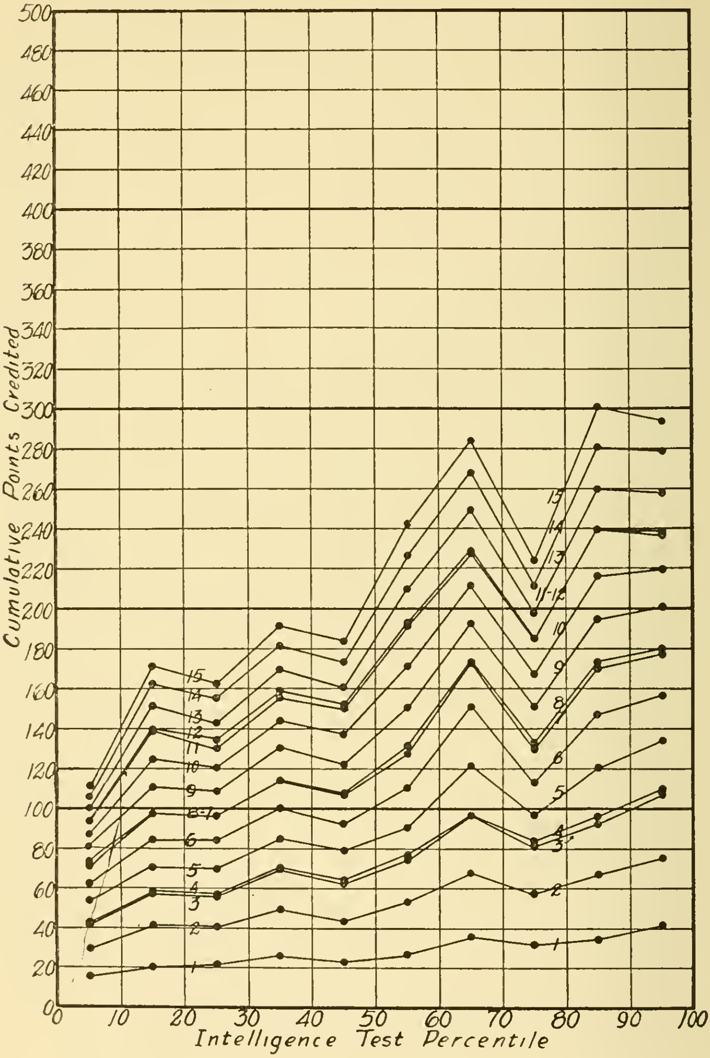


TABLE 35

AVERAGE ATTAINMENTS OF THE 1-10 PERCENTILE STUDENTS AND THE 91-100 PERCENTILE STUDENTS

Number of Quarters of Possible Attendance	End of Calendar Quarter	Average Credit on the Registrar's Books at the End of the Quarter Designated											
		Average Cumulative Hours Credited		Relative Efficiency	Average Cumulative Points		Relative Efficiency	Average Hours Per Quarter Earned in the Quarter Designated		Relative Efficiency	Average Points Per Quarter Earned in the Quarter Designated		Relative Efficiency
		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile	
0	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1923-24 A	8.3	15.6	1.88	15.3	41.7	2.73	8.3	15.6	1.88	15.3	41.7	2.73
2	W	15.9	28.7	1.81	29.4	75.4	2.56	6.8	13.1	1.93	14.1	33.7	2.39
3	S	22.3	40.8	1.83	41.7	107.0	2.57	7.2	12.1	1.68	12.3	31.6	2.57
4	Su	22.7	41.9	1.85	42.4	110.0	2.59	.4	1.1	2.75	.7	3.0	4.29
5	1924-25 A	28.6	51.2	1.79	53.2	133.9	2.52	5.9	9.3	1.58	10.8	23.9	2.25
6	W	33.1	59.6	1.80	62.4	156.4	2.51	4.5	8.4	1.87	9.2	22.5	2.45
7	S	37.5	66.7	1.78	71.2	177.3	2.49	4.4	7.1	1.61	8.8	20.9	2.38
8	Su	38.3	67.6	1.77	73.1	180.0	2.47	.8	.9	1.13	1.9	2.7	1.42
9	1925-26 A	41.9	75.0	1.79	80.5	201.0	2.50	3.6	7.4	2.06	7.4	21.0	2.84
10	W	43.6	82.4	1.89	86.8	219.6	2.53	1.7	7.4	4.35	6.3	18.6	2.95
11	S	48.2	88.7	1.84	93.2	237.2	2.55	4.6	6.3	1.37	6.4	17.6	2.75
12	Su	48.2	89.3	1.85	93.2	238.6	2.56	0.0	.6	*	0.0	1.4	*
13	1926-27 A	50.9	96.9	1.90	100.0	258.7	2.59	2.7	7.6	2.81	6.8	20.1	2.96
14	W	53.2	103.9	1.95	105.7	278.9	2.64	2.3	7.0	3.04	5.7	20.2	3.54
15	S	55.4	109.6	1.98	111.2	294.1	2.64	2.2	5.7	2.59	5.5	15.2	2.76

* Indeterminate Values.

TABLE 36

Basic Perseverance-Elimination Table of Women

Number of Quarters of Possible Attendance	End of Calendar Quarter		Number of Women Who, at the End of the Quarter Specified at the Left Margin, Completed the Following Designated Ordinal Quarters of Work (Actual Number of Quarters Completed)															Completed Work in Designated Quarter	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	Per Cent
1	1923-24	A	264															264	98.1
2		W	1	239														240	89.2
3		S		4	222													226	84.0
4		Su		2	4	22												28	10.4
5	1924-25	A		1	4	165	21											191	71.0
6		W			1	5	144	20										170	63.2
7		S				1	9	130	20									160	59.5
8		Su			1		1	2	11	3								18	6.7
9	1925-26	A				1	1	9	93	19	3							126	46.8
10		W					3	3	6	90	18	3						123	45.7
11		S						1	5	8	87	17	3					121	45.0
12		Su						2	4	2	2	11	5	2				28	10.4
13	1926-27	A							1	2	6	68	21	4	1			103	38.3
14		W									2	7	66	21	1	1		98	36.4
15		S										2	8	64	18			92	34.2
Entrants Who Completed at Least the Ordinal Numbers of Quarters Designated	Number		265	246	232	194	179	167	140	124	118	108	103	91	20	1			
	Per Cent		98.5	91.4	86.2	72.1	66.5	62.1	52.0	46.1	43.9	40.1	38.3	33.8	7.4	.4	0		
Entrants Not Completing at Least Ordinal Numbers of Quarters Designated	Number		4	23	37	75	90	102	129	145	151	161	166	178	249	268	269		
	Per Cent		1.5	8.5	13.8	27.9	33.5	37.9	48.0	53.9	56.1	59.9	61.7	66.2	92.6	99.6	100.0		

TABLE 37

QUARTERS OF ATTENDANCE OF STUDENTS WHO GRADUATED BY JUNE, 1927

Calendar Quarter		Numbers of Students Who Graduated after Completing the Following Numbers of Quarters of Work			Total
		11	12	13	
1925-26	S	1			1
	Su ...	1			1
1926-27	A		2		2
	W ...	1	2	1	4
	S		49	8	57
Total		3	53	9	65

TABLE 38

CUMULATIVE POINT-HOUR-RATIOS OF NON-GRADUATING STUDENTS

Cumulative Point-Hour-Ratio at the Time of Last Record	Number of Such Students Persisting at Least Ten Quarters
3.75–3.99	
3.50–3.74	1
3.25–3.49	1
3.00–3.24	4
2.75–2.99	1
2.50–2.74	6
2.25–2.49	8
2.00–2.24	13
1.75–1.99	8*
1.50–1.74	1
Total	43

* Two of these eight had less than 1.8, the minimum required for graduation.

TABLE 39

CREDIT HOURS STILL TO BE EARNED AFTER TEN QUARTERS

Credit Hours to be Earned for Degree*	Number of Students
Sufficient	6
1–10	7
11–20	5
21–30	9
31–40	1
41–50	10
51–60	
61–70	
71–80	2
81–90	
91–100	
101–110	1
Total	41**

* Provided all credit possessed is applicable toward degree sought.

** Two students are not shown here. One had completed 2 quarters in Arts-Medicine and one 2 quarters in Medicine, leaving at least 4 years and one quarter for each to complete in the College of Medicine.

TABLE 40

DISTRIBUTION OF TRANSFERS (WOMEN)

To the College of	Number of Students who Transferred out of the College after Completing the following number of Quarters of Attendance in the College of Arts											
	1	2	3	4	5	6	7	8	9	10	11	Total
Agriculture		1	3									4
Commerce	6	6	8	3	4		1					28
Education	7	4	14	11	5	8						49
Law						2	1			1		4
Medicine									1			1
Applied Optics	1											1
Arts—Education	1	1	3	1	2	3			2			13
Arts—Medicine									1		1	2
Total	15	12	28	15	11	13	2		4	1	1	102
Cumulative Number	15	27	55	70	81	94	96	96	100	101	102	
Cumulative Per Cent	14.7	26.5	53.9	68.6	79.4	92.2	94.1	94.1	98.0	99.0	100.0	

FIGURE 20

Graph Showing the Extent of Retention, Measured in Per Cents of the Original 269 Women Entrants, in Relation to Numbers of Quarters of Attendance in the Arts College (Large Cross-Hatched Area Under Curve A); in the Colleges of Ohio State University Other Than Arts (Small Cross-Hatched Area, Between Curves A and B); and in Both, all the Area Under Curve B

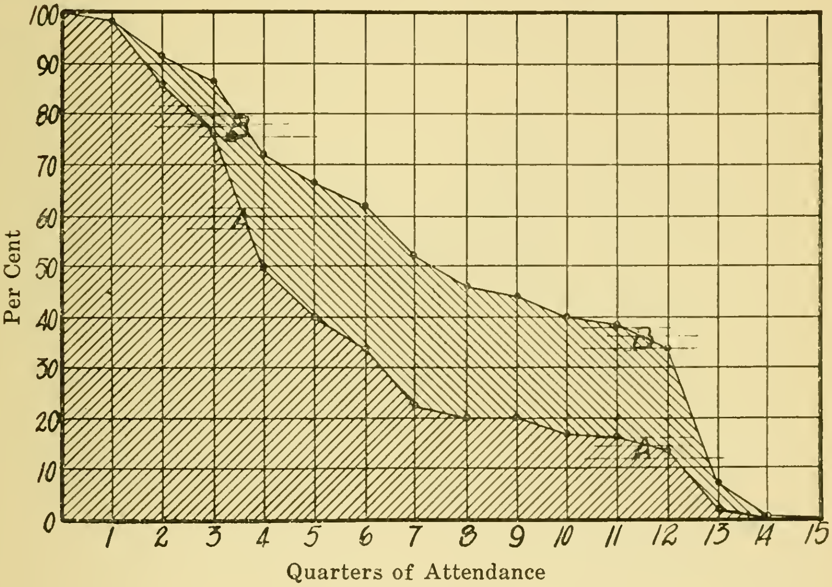


TABLE 41

Basic Follow-Up Table Showing the Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation (Women)

Cumu. Point-Hour-Ratio at Last Time of Record	Intelligence Test Percentile										Total non-Grad	Total Arts-Grad	Tot non Arts Grad	GRAND TOTAL
	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100				
375-399									▢11			1		1
350-374						⑫			③	▢12	2	1		3
325-349							⑤ ▢12	▢12 ▢12	③	③ ⑩ ▢12	4	4		8
300-324	△12	△12		③ ⑫	③ ⑧ △12	⑫	⑥ ⑥ ⑩	⑪ ▢12	① ⑥ △12	▢12	11	2	4	17
275-299	△12	△12			△12	⑨	△12 △13 ④ ⑫	▢12 ▢12 ▢12	⑥ △12	△12 ▢12 ▢12	4	5	7	16
250-274		⑬	⑪	△12 ▢12 ⑥ ▢12	⑥ △12 △12	△12 ⑤ ▢12	▢12 ▢12	△12 △12 ③ ⑫	① ⑤ △12 ⑪ ⑪	④ ⑫	13	5	7	25
225-249	▢12	⑥ △12	③ ⑫ ⑬	▢12 ▢12 ▢12 △12 △12 ⑨ ⑫	③ ⑬	⑥ ⑪ ▢12	② ⑥ ⑦ ⑪ ⑬	⑤ ⑩ △12	⑧ △12	⑥ ⑦	20	5	5	30
200-224	④ ⑥ ⑪ ⑬	⑫ ⑫ ⑬	③ ⑭	△12 ▢12 ② ▢12 ④ ⑫ ⑫	② ⑤ △12 ③ ⑫ △12	△12 △12 △12 ③ ▢12 ⑦ ⑫ ⑫	⑤ △12 ▢13 ⑦ ⑩	⑤ ▢12	③ ④ △12 ⑥ ⑥ ⑪	③	31	5	8	44
175-199	⑦	⑦ △12	③ ⑨ △12	③ △12 ③ ⑥	△12 ② ② ⑧ ⑤ ⑥ ⑦ ⑧ ⑫	▢12 ▢13 ① ① ③ ③ ⑫ ⑬	③ ⑨	① ⑬ ⑬	⑩ ⑪ ⑪	②	30	2	4	36
150-174	③ ⑨ ⑨	③ ③ ④ ④ ⑥ ⑦ ⑨	④ ⑥ ⑥ ⑥ ⑨ ⑬	② ⑥ ⑥	⑤ ⑦ ⑧	③		⑦	① ③	① ④	28			28
125-149	⑥	① ⑦ ⑧	④ ④ ⑦	④ ⑨	③ ③ ⑨	⑤ ⑥	①		⑥	⑥	17			17
100-124	② ②	③ ⑦	③ ⑤ ⑤ ⑦	③	④	③ ⑥ ⑦	④ ⑥ ⑥			③	17			17
75-99	② ② ② ⑤ ⑧	③ ③ ⑦		①		④	③				11			11
50-74	②	②		① ③	①						5			5
25-49	①			①			①				3			3
0-24	①	①	①					①			4			4
Total non Grad	19	23	22	22	25	23	22	11	21	12	200			
Total Arts Grad	1			7		5	4	7	1	5		30		
Tot non-Arts Grad	2	4	1	5	7	4	3	3	5	1			35	
GRAND TOTAL	22	27	23	34	32	32	29	21	27	18				265

FIGURE 21

The Average Progress in Cumulative Hours Made by Women Students at Each Intelligence Test Percentile, Quarter by Quarter, for 15 Successive Quarters

N = 269

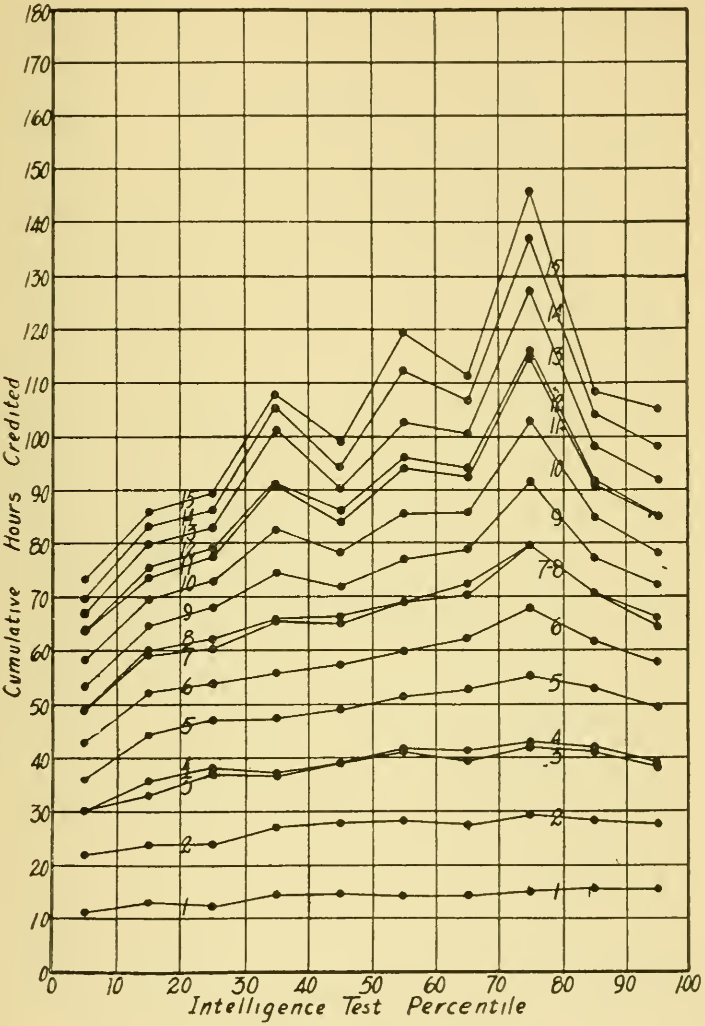


FIGURE 22

The Average Progress in Cumulative Points Made by Women Students at Each Intelligence Test Percentile, Quarter by Quarter, for 15 Successive Quarters

N = 269

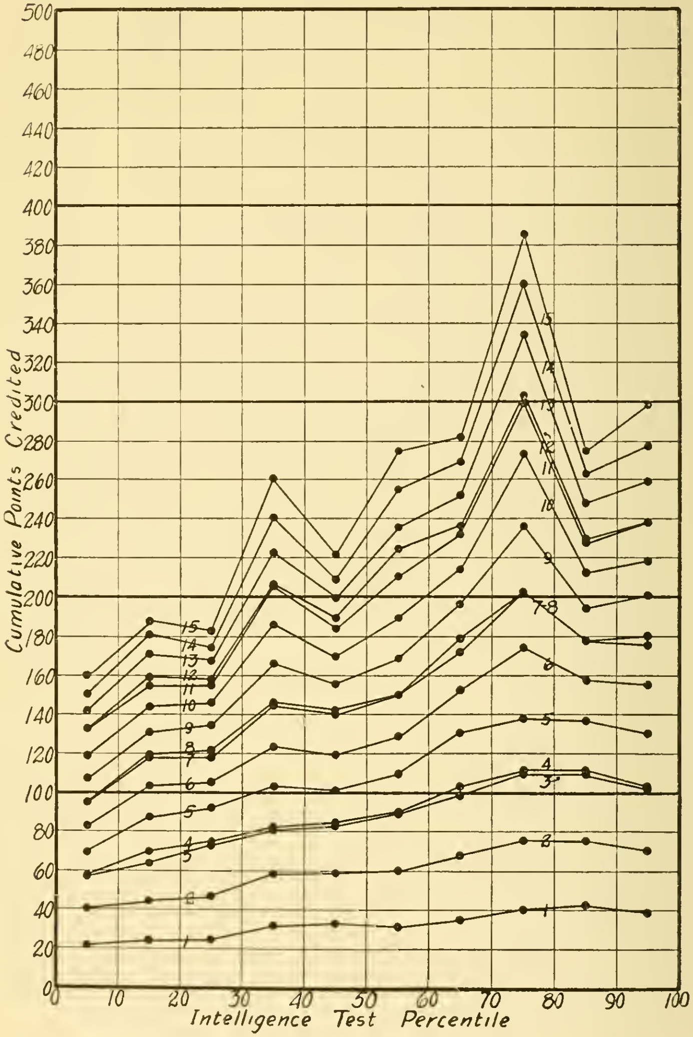


TABLE 42

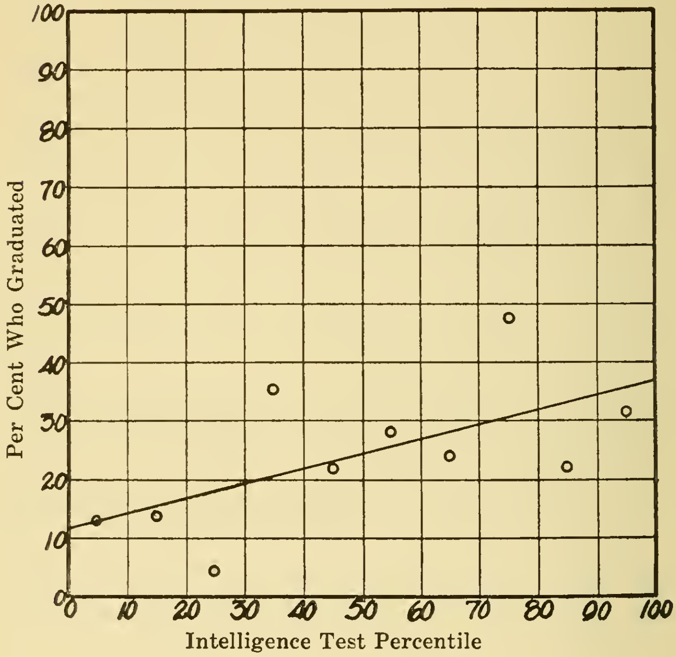
AVERAGE ATTAINMENTS OF THE 1-10 PERCENTILE STUDENTS AND THE 91-100 PERCENTILE STUDENTS

Number of Quarters of Possible Attendance	End of Calendar Quarter	Average Credit on the Registrar's Books at the End of the Quarter Designated											
		Average Cumulative Hours Credited		Relative Efficiency	Average Cumulative Points		Relative Efficiency	Average Hours Per Quarter Earned in the Quarter Designated		Relative Efficiency	Average Points Per Quarter Earned in the Quarter Designated		Relative Efficiency
		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile	
0	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1923-24 A	11.4	15.4	1.35	21.4	38.4	1.79	11.4	15.4	1.35	21.4	38.4	1.79
2	W	22.1	27.6	1.25	40.1	70.8	1.76	10.7	12.2	1.14	18.7	32.4	1.73
3	S	30.2	38.4	1.27	56.7	102.3	1.80	8.1	10.8	1.33	16.6	31.5	1.90
4	Su	30.4	39.2	1.29	57.0	103.4	1.81	.2	.8	.40	.3	1.1	3.67
5	1924-25 A	36.4	49.4	1.36	69.0	130.9	1.90	6.0	10.2	1.70	12.0	27.5	2.29
6	W	43.0	57.8	1.34	82.7	155.8	1.88	6.6	8.4	1.27	13.7	24.9	1.82
7	S	48.9	64.7	1.32	94.9	175.5	1.85	5.9	6.9	1.17	12.2	19.7	1.61
8	Su	48.9	66.2	1.35	94.9	180.2	1.90	.0	1.5	*	.0	4.7	*
9	1925-26 A	53.6	72.3	1.35	107.0	200.3	1.88	4.7	6.1	1.30	12.1	20.6	1.70
10	W	58.4	78.3	1.34	118.7	218.9	1.84	4.8	6.0	1.25	11.7	18.1	1.55
11	S	63.8	85.1	1.33	132.5	238.7	1.80	5.4	6.8	1.26	13.8	19.8	1.43
12	Su	63.8	85.1	1.33	132.5	238.7	1.80	.0	.0	*	.0	.0	*
13	1926-27 A	67.0	91.9	1.37	141.6	259.0	1.83	3.2	6.8	2.12	9.1	20.3	2.23
14	W	69.8	98.1	1.40	141.9	277.7	1.96	2.8	6.2	2.21	.3	18.7	62.33
15	S	73.4	105.1	1.43	160.0	298.3	1.86	3.6	7.0	1.94	18.1	20.6	1.14

* Indeterminate Values.

FIGURE 23

Per Cent of Entering Students at Each Intelligence Test Level Who Graduated in Four Years



CHAPTER V

THE COLLEGE OF COMMERCE

FOLLOW-UP STUDY OF MEN

ELIMINATION, PERSISTENCE, AND GRADUATION

Table 43 shows the basic data concerning the persistence and elimination of the 342 men who entered the College of Commerce and Journalism in the Autumn of 1923. Of these 342 entrants, 292 (85.4 per cent) completed at least three quarters of work; 206 (60.2 per cent) completed at least six quarters of work; and only 130 (38.0 per cent) completed as much as nine quarters of work. The elimination was rather excessive. The table also shows that there was considerable retardation. If three quarters of work each calendar year be considered normal progress, then the numbers of cases shown in the boxes along the diagonal were making *just normal progress.* The numbers of cases to the right and above the diagonal were accelerated in the school progress (did more than three quarters of work each year) by going to summer school one or more summers in addition to attendance during the Autumn, Winter, and Spring Quarters. The numbers of cases to the left and beneath the diagonal were retarded one or more quarters; that is, had gone less than three quarters each calendar year. Fifteen of those who entered in the Autumn Quarter 1923 withdrew before completing any work. Five of the 15 returned, 3 completing their first quarter during the Winter Quarter 1923-24 and one each during the following Autumn and Winter Quarters.

Of those who entered in the Autumn Quarter 1923, 64.6 per cent completed work in the Autumn Quarter 1924 (one year later), 48.2 per cent completed work in the Autumn Quarter 1925 (two years after entrance), and 36.3 per cent completed work in the Autumn Quarter 1926 (three years after entrance).

GRADUATION

Of the 342 men who entered the College of Commerce and Journalism in the Autumn 1923, by June 1927, four years later, only 48 (14.0 per cent) had graduated. Forty-six of the 48 graduates received degrees from the College of Commerce and Journalism. None of the 48 completed their work in less than 12 quarters. Ten required more than 12 quarters.

There were 65 students who completed 10 or more quarters of work, but had not, by June, 1927, received a degree. Table 44 shows the distribution of the cumulative point-hour-ratio of these 65 students. Of these 65 students, 49 had a point-hour-ratio above the 1.8 minimum required for graduation. The average point-hour-ratio for the 65 students is 2.14.

Table 45 shows the numbers of credit hours still to be earned by the 65 students, before they can receive a degree in the college in which they were last enrolled. It is assumed that all of the hours for which they were credited are applicable toward a degree in that college.

Of these 65 students 19 could probably complete the work for a degree with only one quarter of work additional. Fourteen more could probably complete their work with two additional quarters of work and 10 with three additional quarters of work. In all, 43 more will probably ultimately graduate, making a total of about 91 of the 342 entrants (26.6 per cent) to the College of Commerce and Journalism who may be expected ultimately to graduate.

ENTRANCE CONDITIONS

Twenty-one of the 342 entrants had a condition in one-half or more units of high-school work when they entered the University. The distribution of amounts is shown in Table 46. All of the entrance conditions were in high-school mathematics.

The average Intelligence Test percentile of this group is 49, which is about average for all University freshmen. The average Intelligence Test score for all 342 entrants was 50.3. The average scholarship at time of last record was 1.46, while that of all the Commerce and Journalism group (332 men who completed one or more quarters) was 1.74. Those who had conditions persisted on the average 5.9 quarters. The average persistence of the entire group was 7.2 quarters.

TRANSFERS

Only 29 (8.5 per cent) of the 342 men entering the College of Commerce and Journalism in the Autumn of 1923 transferred to some other college in the Ohio State University. Table 47 shows the college to which such transfers were made and the time of transfer. Of the 29 who transferred out of the College of Commerce, eight made a second transfer, four back to the College of Commerce, one into Law, one into Dentistry, and two into Medicine.

Nearly half (14 out of 29) of the transfers were to the College of Arts. Twenty of the 29 transfers were made before the student's fourth quarter in school; that is, during the first year of university attendance.

PREDICTION OF SCHOLARSHIP, PERSISTENCE, AND GRADUATION

Table 48 shows the interrelations of the Intelligence Test score, scholarship, persistence, and graduation. The notation of Table 48 is as follows:

1. Each circle, square, or triangle represents one student who entered the College of Commerce and Journalism in the Autumn Quarter 1923 and completed at least one quarter of work.
2. A student represented by a circle had not graduated by June, 1927.
3. A student represented by a square had, by June, 1927, received a degree from the College of Commerce and Journalism.
4. A student represented by a triangle followed by a letter or letters had, by June, 1927, graduated from some college of the Ohio State University other than Commerce and Journalism.

   The letter or letters designate the College:

   A — Arts
   Ed — Education
5. The number in each circle, square, or triangle is the number of quarters of work which that student completed in the University.

There is a positive relationship between the Intelligence Test percentile and the cumulative point-hour-ratio at last time of record. (The correlation is .44). The data of Table 48 may be used as a scholastic expectancy table.

If the Entrance Board's Estimate of the high-school record be added to the Intelligence Test score, the prediction of scholarship can be appreciably improved. The correlation obtained by such a procedure was .52.

The relationship of the Intelligence Test score to the average cumulative credit hours at the end of each of the 15 successive possible quarters of attendance is shown in Figure 24. In general the graph shows that the higher the Intelligence Test percentile the greater the number of credit hours a student will have to his credit at the end of any given quarter. If a measure of school attainment be used which gives greater weight to *quality* of work than does hours credited, the differences in the attainments of the different Intelligence Test levels are more striking. Figure 25 shows the average cumulative points for students of different Intelligence Test percentile at the end of each of the 15 successive possible quarters of attendance.

Table 49 shows a detailed comparison of the relative attainments of the 1-10 percentile students and the 91-100 percentile students. The attainment of the group having the higher Intelligence Test scores is consistently better than that of the group having low Intelligence Test scores. The ratio of the average cumulative hours credited of the 91-100 percentile students increases from 1.38 at the end of the first quarter to 1.94 at the end of the fifteenth quarter (Column 4, Table 49). The ratio of the average cumulative points for the same two groups varies about 2.50 (Column 7, Table 49).

The probability of graduation based on the Intelligence Test percentile is shown in Figure 26. The higher the test score the greater is the probability of graduation. The equation

$$Y = .261X + 3.118$$

where X is the Intelligence Test percentile, gives the chances in 100 of graduation within four years after entrance. This is the straight line shown in Figure 26. A student whose percentile is 10 has, thus, about 6 chances in 100 of graduation; if the percentile is 50, there are about 16 chances in 100 of graduation within four years after entrance; if the percentile is 100, there are about 29 chances in 100 of graduation within four years after entrance.

Persistence, measured by the numbers of quarters that a student stays in school, shows very little relationship to the Intelligence Test score (the correlation is .19) or to the Entrance Board's Estimate of the high-school record (a correlation of .20). If one waits until the end of the first quarter, persistence may be predicted somewhat better by using the point-hour-ratio of the first quarter. (There is a correlation of .36 between the first quarter marks and persistence).

SUMMARY AND CONCLUSIONS

1. Three hundred forty-two men entered the College of Commerce in the Autumn of 1923. The rate of elimination was fairly high; 85.4 per cent completed at least three quarters of work; 60.2 per cent completed at least six quarters of work; and only 38.0 per cent completed at least nine quarters of work.
2. In the progress from quarter to quarter, considerable retardation is shown.
3. Only 48 (14.0 per cent) of the 342 entrants had graduated four years after entrance.
4. Of these 48 graduates, only 2 had graduated from colleges in Ohio State University other than Commerce.
5. Ultimately 43 more of the 342 may be expected to graduate, since they have a year or less of work to do and have a point-hour-ratio above the 1.8 minimum required for graduation. These would bring up the proportion of entrants who ultimately graduate to about 27 per cent.
6. Twenty-one of the 342 had one-half or more units entrance conditions in high-school mathematics. This group is inferior

in school performance, both point-hour-ratio and persistence, and has a lower average Intelligence Test score than the entire 342.

7. Twenty-nine of the 342 entrants made one or more transfers. Nearly half of these went into the College of Arts. Twenty of the first transfers were made by the beginning of the fourth quarter. Eight made a second transfer, four of whom returned to Commerce.
8. The Intelligence Test percentile shows positive relationship to school achievement. Those having the test scores of 91-100 percentile have on the average from 1.38 at the end of the first quarter to 1.94 times as many credit hours at the end of the fifteenth possible quarter as do those having an Intelligence Test score of 1-10 percentile. The high Intelligence Test score group had on the average about 2.5 times as many points at the end of the various successive quarters of possible attendance as did the low Intelligence Test score group.
9. If the Entrance Board's Estimate of the high-school record be added to the Intelligence Test score, the prediction of scholarship is bettered considerably.
10. A greater proportion of those having high Intelligence Test scores graduate than do those who have low Intelligence Test scores.
11. Persistence shows practically no relationship to the Intelligence Test score or the Entrance Board's Estimate of the high-school record. First quarter marks are better than either or both of the above measures for predicting persistence.

FOLLOW-UP STUDY OF WOMEN

The 51 women who entered the College of Commerce and Journalism in the Autumn Quarter, have, even though they are a small group, been treated as an independent group. There was no curricular differentiation in the college for the sexes. Studies made for the other colleges of the Ohio State University show that there are some sex differences in the relations of persistence, school marks, Intelligence Test scores, and graduation.

PERSISTENCE, ELIMINATION, AND GRADUATION

Table 50 shows the basic data concerning the persistence and elimination of the 51 women who entered the College of Commerce in the Autumn of 1923. The percentage of entrants who completed any given ordinal number of quarters is very similar to that shown for the 342 men who entered the College of Commerce at the same time. All of the 51 women who entered completed at least one quarter of work. The proportions completing work at the end of any given calendar quarter of work also compares quite favorably with that of the men.

Neither retardation nor acceleration (doing less than or more than 3 quarters of work respectively each calendar year) was very great. The entries in the boxes along the diagonal show the numbers of students who made *just normal progress* at the various stages of their college courses. The entries above and to the right of the diagonal are the numbers of students who were accelerated in their college attendance; that is, were doing more than three quarters of work each year.

GRADUATION

Thirteen of the 51 women (25.5 per cent) had graduated from the Ohio State University by June, 1927, four years after entrance. Nine (17.6 per cent) of these were graduated from the College of Commerce, two from Education, and two from Arts.

Seven other students had, by June, 1927, finished 10 or more quarters of work, but had not graduated. Four of the 7 had enough credit hours and a sufficiently high scholastic average to enable them to graduate with one more quarter of work. One other could graduate with two additional quarters of work and one with three more quarters of work. The seventh student had a point-hour-ratio of 1.75 (the minimum allowed for graduation is 1.80) and lacked 46 credit hours. She could probably graduate with three quarters more of work. Thus the number who will probably ultimately graduate is 20 (39.2 per cent of the entrants).

ENTRANCE CONDITIONS

Nine of the 51 entered the University with 1 or 2 units of entrance conditions in high-school mathematics. The average Intelligence Test percentile of these 9 students is 44, their average point-hour-ratio was 2.07 and their average persistence 6.9 quarters. The averages of the entire 51 (which includes these 9 cases) were as follows: Intelligence Test percentile, 60.1; point-hour-ratio, 2.10 at time of last record; persistence 7.67 quarters. While the 9 who had entrance conditions have a markedly lower Intelligence Test score than the group as a whole, their achievement in terms of quality is about the same and average persistence about one quarter less.

TRANSFERS

Eleven of the 51 entrants transferred out of the College of Commerce to some other college in the University. The time of transfer and the college to which the transfer was made are shown in Table

51. One of the 11 made a second transfer—from Arts-Education to Education at her eighth quarter.

PREDICTION OF SCHOLARSHIP, PERSISTENCE, AND GRADUATION

Table 52 shows the interrelations between scholarship, Intelligence Test score, persistence, and graduation of the 51 women who entered the College of Commerce in the Autumn Quarter 1923. The notation used in the table is as follows:

1. Each circle, square, or triangle represents one student.
2. A circle means that that student had not graduated from Ohio State University by June, 1927.
3. A square signifies that that student had graduated from the College of Commerce.
4. A triangle followed by a letter or letters indicates that the student graduated from some college other than Commerce. The letter or letters are as follows:

   A — Arts
   Ed — Education
5. The number inside the circle, square, or triangle is the number of quarters of work which that student completed in the University.

The relationship shown between the point-hour-ratio and Intelligence Test percentile is not very great. (The correlation is .34). By adding the Entrance Board's Estimate of the high-school record to the test score the prediction of scholarship can be bettered considerably. (The correlation was raised to .54).

The Intelligence Test percentile and the Entrance Board's Estimate of the high-school record show little relationship to persistence. The first quarter marks show but little more relationship to persistence. So, for this group, persistence cannot be predicted by use of any of the available measures.

The table shows that there is a positive relationship between Intelligence Test percentile and the proportion of students who graduated. More of those who had high test scores graduated than did those having low test scores.

SUMMARY AND CONCLUSIONS

1. Fifty-one women entered the College of Commerce in the Autumn of 1923. All of the 51 completed at least one quarter of work.
2. The persistence and elimination of this group was very similar to that of the men entering the College of Commerce at the same time.

3. Neither retardation nor acceleration was very great. Most of the women progressed at the normal rate of 3 quarters of work per year as long as they persisted in the University.
4. Thirteen of the 51 (25.5 per cent) entrants graduated, nine of them from the College of Commerce.
5. Nine of the 51 had entrance conditions in high-school mathematics. The scholarship of these 9 was about the same as for all the 51.
6. Eleven transferred to some other college; five to Arts; five to Education; one to Arts-Education, and later to Education.
7. The Intelligence Test percentile shows a positive relationship to scholarship. Adding the Entrance Board's Estimate of the high-school record to the test score makes the relationship to scholarship markedly better.
8. The Intelligence Test percentile, the Entrance Board's Estimate of the high-school record, and the first quarter point-hour-ratio show little relationship to persistence.

TABLE 43

BASIC PERSEVERANCE-ELIMINATION TABLE OF MEN

Number of Quarters of Possible Attendance	End of Calendar Quarter		Number of Persons Who, at the End of the Quarter Specified at the Left Margin, Completed the Following Designated Ordinal Quarters of Work (Actual Number of Quarters Completed)															Completed Work in Designated Quarter	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	Per Cent
1	1923-24	A	327															327	95.6
2		W	3	304														307	89.8
3		S		9	268													277	81.0
4		Su			1	15												16	4.7
5	1924-25	A	1	5	10	192	13											221	64.6
6		W	1	3	5	16	172	12										209	61.1
7		S		1	4	4	19	156	12									196	57.3
8		Su			1	1		3	9	2								16	4.7
9	1925-26	A			1	8	9	15	115	15	2							165	48.2
10		W					5	11	13	110	11	2						152	44.4
11		S					2	7	9	12	96	11	1					138	40.4
12		Su							1		3	12	2	1				19	5.6
13	1926-27	A			1		1	1	7	7	9	76	19	2	1			124	36.3
14		W			1	2			3	4	5	7	74	18	2	1		117	34.2
15		S				1		1		2	4	5	6	72	15	1	1	108	31.6
Entrants Who Completed at Least the Ordinal Numbers of Quarters Designated	Number		332	322	292	239	221	206	169	152	130	113	102	93	18	2	1		
	Per Cent		97.1	94.2	85.4	69.9	64.6	60.2	49.4	44.4	38.0	33.0	29.8	27.2	5.3	.6	.3		
Entrants Not Completing at Least Ordinal Numbers of Quarters Designated	Number		10	20	50	103	121	136	173	190	212	229	240	249	324	340	341		
	Per Cent		2.9	5.8	14.6	30.1	35.4	39.8	50.6	55.6	62.0	67.0	70.2	72.8	94.7	99.4	99.7		

TABLE 44

CUMULATIVE POINT-HOUR-RATIOS OF NON-GRADUATING STUDENTS

Cumulative Point-Hour-Ratio at the Time of Last Record	Number of Such Students Persisting at Least Ten Quarters
3.75–3.99	
3.50–3.74	
3.25–3.49	1
3.00–3.24	4
2.75–2.99	4
2.50–2.74	8
2.25–2.49	4
2.00–2.24	12
1.75–1.99	20
1.50–1.74	10
1.25–1.49	1
1.00–1.24	
.75– .99	1
Total	65

TABLE 45

CREDIT HOURS STILL TO BE EARNED AFTER TEN QUARTERS

Hours Still to be Earned for Degree*	Number of Students
Sufficient	12
1–10	13
11–20	8
21–30	10
31–40	3
41–50	7
51–60	1
61–70	3
71–80	1
81–90	2
91–100	2
Total**	62

* Provided all credit possessed is applicable toward degree sought.

** Three cases are not shown in the table. One had received a certificate in Pharmacy (not a degree). One had completed only the first year in Medicine, and one had completed the first two years in Medicine, leaving four and three years work, respectively, to be done.

TABLE 46

DISTRIBUTION OF THE AMOUNTS OF ENTRANCE CONDITIONS

Number of Units of Entrance Conditions	Number Having Given Amounts of Conditions
½	3
1	14
2	4
Total	21

TABLE 47

DISTRIBUTION OF TRANSFERS (MEN)

To the College of	Number of Students Who Transferred Out of the College after Completing the Following Number of Quarters of Attendance in the Commerce and Journalism College										Total
	1	2	3	4	5	6	7	8	9	10	
Arts		3	10			1					14
Agriculture		1									1
Engineering			2	1		1					4
Education		1	1	1							3
Law						4				1	5
Pharmacy			2								2
Total		5	15	2		6				1	29
Cum. Number		5	20	22	22	28	28	28	28	29	
Cum. Per Cent		17.2	69.0	75.9	75.9	96.6	96.6	96.6	96.6	100.0	

TABLE 48

Basic Follow-Up Table Showing the Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation (Men)

		Intelligence Test Percentile													
		1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Total non Grad	Total C.&J. Grad	Tot. non C.-J. Grad	GRAND TOTAL
Cumu. Point-Hour-Ratio at Last Time of Record	3.75 - 3.99														
	3.50 - 3.74										⑤	1			1
	3.25 - 3.49			⑫	②	⑥				$\boxed{12}$	$\boxed{12}$	3	2		5
	3.00 - 3.24			⑫					⑤ ⑫		⑫ ⑬ $\boxed{12}$	5	1		6
	2.75 - 2.99		⑥		③	$\boxed{12}$		⑧ $\boxed{12}$	⑫	⑩ $\boxed{12}$ $\boxed{12}$ ⑫ $\boxed{12}$ $\boxed{13}$	③ ③ ⑫	9	6		15
	2.50 - 2.74		$\boxed{12}$			② ⑫ $\boxed{12}$	⑫ $\boxed{13}$	③ ⑩	⑫ $\boxed{12}$ $\boxed{12}$	⑥ ⑨ $\boxed{12}$ ⑫ ⑫ $\boxed{13}$	② ② $\boxed{12}$ ⑦ ⑫ ⑮	15	8		23
	2.25 - 2.49	$\boxed{12}$		⑧	③ $\boxed{12}$ ⑪ $\boxed{13}$	③ $\boxed{12}$	⑫ $\boxed{12}$ $\boxed{12}$	$\boxed{12}$ $\boxed{12}$ ③ ③ ⑥ ⑥ ⑫	② ⑤ $\boxed{12}$	① $\boxed{12}$ ⑥ ⑦ ⑩	$\boxed{12}$	16	11		27
	2.00 - 2.24	② $\triangle 12$ ⑩ ⑫	⑬ $\boxed{12}$ $\boxed{12}$	$\boxed{12}$ $\boxed{12}$ $\boxed{12}$ ④ ⑬	⑤	③ ⑫ $\triangle$ [illegible]	② $\boxed{12}$ ④ ⑨	④ ⑥ $\boxed{12}$ ⑫ ⑫ ⑫	① ① $\boxed{12}$ ② ③ $\boxed{13}$ ③ ⑨ ⑫	④ ⑦ ⑦ ⑪ ⑫	⑬ $\boxed{13}$	30	10	2	42
	1.75 - 1.99		④ ⑥ $\boxed{13}$ ⑪ ⑫ ⑫	⑤ ⑦ ⑨ ⑫	③ $\boxed{12}$ ⑥ ⑩ ⑫	③ ⑨ ⑪ ⑫ ⑫ ⑫ ⑫ ⑬	③ $\boxed{13}$ ⑥ ⑪ ⑫	⑥ ⑥ ⑪	⑦ $\boxed{12}$ ⑧ ⑨ ⑫	③ ⑤ $\boxed{12}$ ⑧ ⑪ ⑫ ⑫ $\boxed{12}$	③ ⑥ $\boxed{13}$ ⑧ ⑫ $\boxed{13}$	42	8		50
	1.50 - 1.74	⑤ ⑥ ⑦ ⑨ ⑨ ⑩ ⑩ ⑫	③ ④ ⑥ ⑨	② ③ ⑥ ⑧	⑥ ⑧ ⑧ ⑫ ⑬	③ ④ ⑥ ⑩	③ ⑥ ⑪ ⑫	① ④ ⑦ ⑥ ⑨ ⑩	③ ⑥ ⑦ ⑩	⑥ ⑥ ⑥ ⑦	③ ③ ④	46			46
	1.25 - 1.49	③ ③ ⑤ ⑥ ⑥	⑧ ⑨	② ② ③ ⑨ ⑨	③ ⑤ ⑤ ⑤	② ⑧ ⑨	③ ⑦ ⑧ ⑧	② ③ ⑥	① ③ ③ ④ ⑨	⑤	⑧ ⑪	34			34
	1.00 - 1.24	② ④ ⑥ ⑥ ⑧	② ③ ⑤ ⑦ ⑧	③ ④ ⑤ ⑨	③ ⑥ ⑥ ⑦ ⑧ ⑧ ⑧ ⑨	③ ⑤ ⑤ ⑦ ⑧	③ ⑥	⑧	⑥ ⑥ ⑦	⑥		34			34
	.75 - .99	③ ⑦	③ ⑥		③ ③ ③ ③ ④	③ ④ ⑧ ⑩	③			④ ④		16			16
	.50 - .74	② ③ ⑤ ⑦	①	②	⑥	②	② ② ②		③	⑤ ⑥		14			14
	.25 - .49	① ② ② ② ② ③ ③	③	②	② ③		②			①		13			13
	0 - .24	② ④	①	②	① ④							6			6
Totol non Grad		36	23	25	36	31	24	26	30	32	21	284			
Total C & J Grad		1	4	3	3	3	5	4	6	10	7		46		
Tot. non-C.-J. Grad		1				1								2	
GRAND TOTAL		38	27	28	39	35	29	30	36	42	28				332

FIGURE 24

THE AVERAGE PROGRESS IN CUMULATIVE HOURS MADE BY MALE STUDENTS AT EACH INTELLIGENCE TEST PERCENTILE, QUARTER BY QUARTER FOR 15 SUCCESSIVE QUARTERS

N = 342

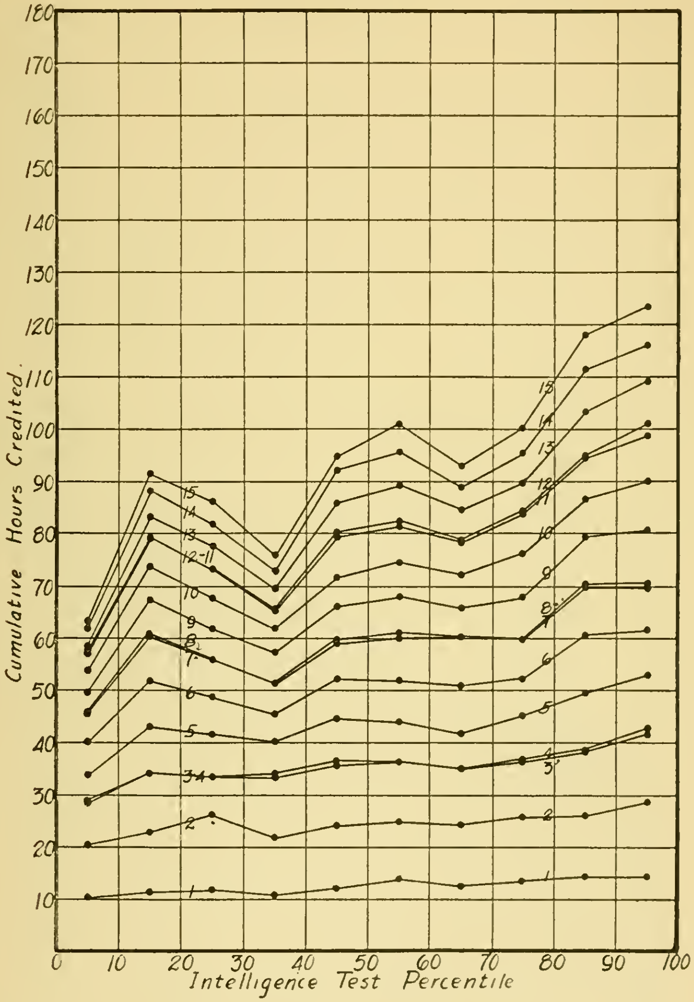


FIGURE 25

THE AVERAGE PROGRESS IN CUMULATIVE POINTS MADE BY MALE STUDENTS AT EACH INTELLIGENCE TEST PERCENTILE, QUARTER BY QUARTER FOR 15 SUCCESSIVE QUARTERS

N = 342

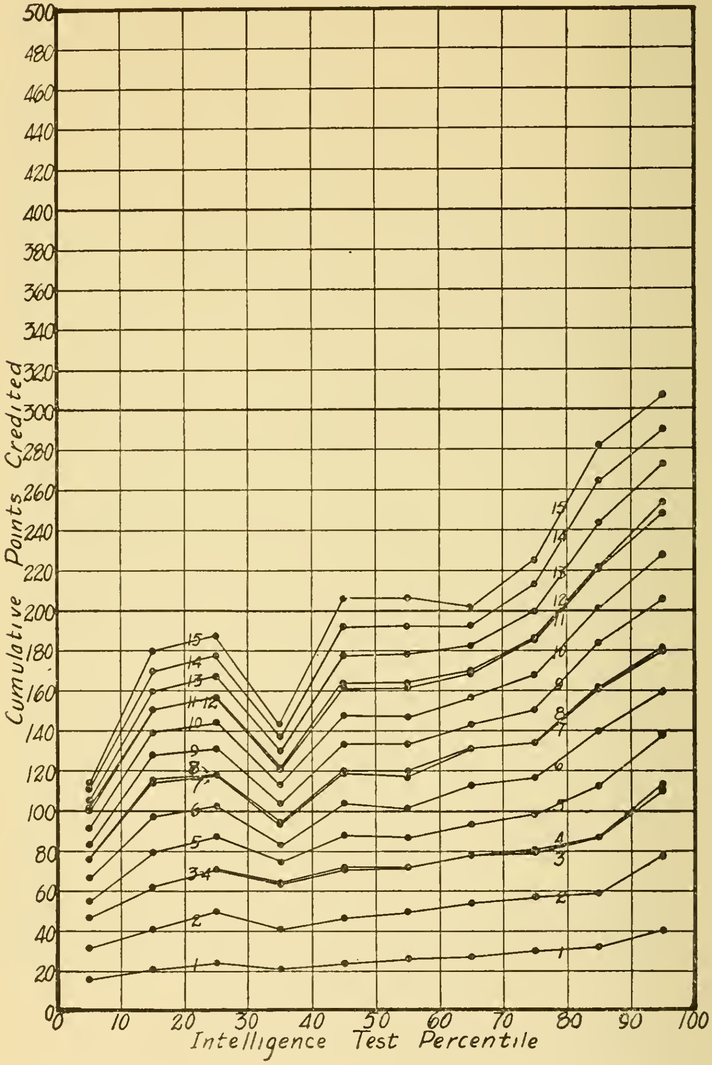


TABLE 49

AVERAGE ATTAINMENTS OF THE 1-10 PERCENTILE STUDENTS AND THE 91-100 PERCENTILE STUDENTS

Number of Quarters of Possible Attendance	End of Calendar Quarter	Average Credit on the Registrar's Books at the End of the Quarter Designated											
		Average Cumulative Hours Credited		Relative Efficiency	Average Cumulative Points		Relative Efficiency	Average Hours Per Quarter Earned in the Quarter Designated		Relative Efficiency	Average Points Per Quarter Earned in the Quarter Designated		Relative Efficiency
		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile	
0	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1923-24 A	10.4	14.4	1.38	15.6	40.6	2.60	10.4	14.4	1.38	15.6	40.6	2.60
2	W	20.2	28.7	1.42	31.7	77.6	2.45	9.8	14.3	1.46	16.1	37.0	2.30
3	S	28.5	41.6	1.46	46.5	110.1	2.36	8.3	12.9	1.55	14.8	32.5	2.20
4	Su	28.8	42.9	1.49	46.8	113.1	2.42	.3	1.3	4.33	.3	3.0	10.00
5	1924-25 A	33.9	52.9	1.56	56.1	138.2	2.46	5.1	10.0	1.96	9.3	25.1	2.70
6	W	40.1	61.6	1.54	66.8	159.6	2.39	6.2	8.7	1.40	10.7	21.4	2.00
7	S	45.5	69.7	1.53	75.8	179.5	2.37	5.4	8.1	1.50	9.0	19.9	2.21
8	Su	45.7	70.6	1.54	75.9	181.5	2.39	.2	.9	4.50	.1	2.0	20.00
9	1925-26 A	49.5	80.6	1.63	83.3	205.4	2.47	3.8	10.0	2.63	7.4	23.9	3.23
10	W	53.7	89.9	1.67	91.7	227.4	2.48	4.2	9.3	2.21	8.4	22.0	2.62
11	S	57.1	98.7	1.73	100.2	248.0	2.47	3.4	8.8	2.59	8.5	20.6	2.42
12	Su	57.5	101.0	1.77	101.1	253.8	2.51	.4	2.3	5.75	.9	5.8	6.44
13	1926-27 A	58.5	109.0	1.86	106.5	272.3	2.56	1.0	8.0	8.00	5.4	18.5	3.43
14	W	61.9	116.0	1.87	111.0	289.9	2.61	3.4	7.0	2.06	4.5	17.6	3.91
15	S	63.4	123.4	1.94	114.2	307.0	2.69	1.5	7.4	4.93	3.2	17.1	5.34

FIGURE 26

Percentages According to Intelligence Test Percentile, of Autumn 1923 Entrants Who Had Graduated by June, 1927

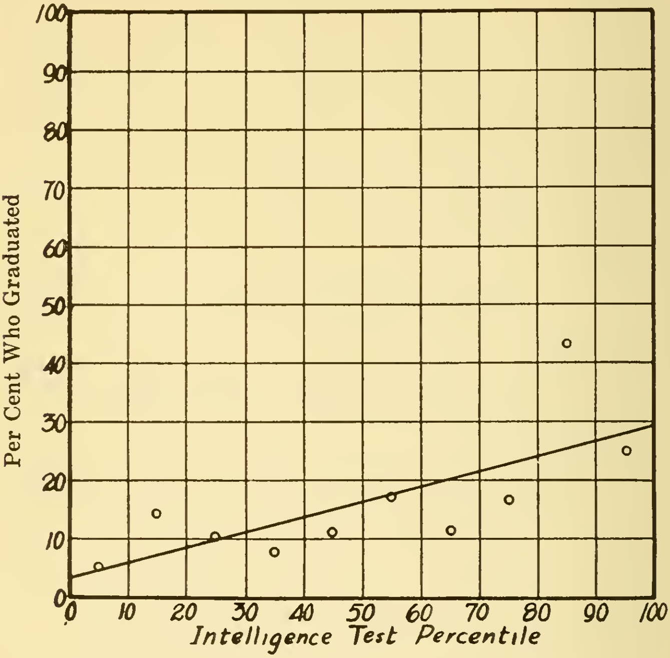


TABLE 50

Basic Perseverance-Elimination Table of Women

Number of Quarters of Possible Attendance	End of Calendar Quarter		Number of Persons Who, at the End of the Quarter Specified at the Left Margin, Completed the Following Designated Ordinal Quarters of Work (Actual Number of Quarters Completed)															Completed Work in Designated Quarter	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	Per Cent
1	1923-24	A	51															51	100.0
2		W		50														50	98.0
3		S			46													46	90.2
4		Su				2												2	3.9
5	1924-25	A				32	2											34	66.7
6		W			1	2	28	2										33	64.7
7		S				2	3	25	2									32	62.8
8		Su				1		1	1									3	5.9
9	1925-26	A					3	2	21	2								28	54.9
10		W					1	1	2	20	1							25	49.0
11		S					1		1	1	18	1						22	43.1
12		Su						1		1	1	4						7	13.7
13	1926-27	A						1	2		1	14	3					21	41.2
14		W						1				1	14	3				19	37.2
15		S							1				1	14	2			18	35.3
Entrants Who Completed at Least the Ordinal Numbers of Quarters Designated	Number		51	50	47	39	38	34	30	24	21	20	18	17	2				
	Per Cent		100.0	98.0	92.2	76.5	74.5	66.7	58.8	47.1	41.2	39.2	35.3	33.3	3.9	0	0		
Entrants Not Completing at Least the Ordinal Numbers of Quarters Designated	Number		0	1	4	12	13	17	21	27	30	31	33	34	49	51	51		
	Per Cent		0	2.0	7.8	23.5	25.5	33.3	41.2	52.9	58.8	60.8	64.7	66.7	96.1	100.0	100.0		

TABLE 51

Distribution of Transfers (Women)

To the College of	Number Who Transferred after Completing the following number of Quarters in the College of Commerce							
	1	2	3	4	5	6	7	Total
Arts	1		1		2		1	5
Education		1	2		1	1		5
Arts-Education			1					1
Total	1	1	4		3	1	1	11
Cum. Number	1	2	6	6	9	10	11	
Cum. Per Cent	9.1	18.2	54.5	54.5	81.8	90.9	100.0	

TABLE 52

Basic Follow-Up Table Showing the Interrelations of Intelligence, Point-Hour-Ratio, Quarters of Persistence, and Graduation (Women)

Cumu Point-Hour-Ratio at Last Time of Record	Intelligence Test Percentile										Total non Grad	Total C-J Grad	Tot. non C-J Grad	GRAND TOTAL
	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100				
3.75-3.99														
3.50-3.74														
3.25-3.49										$\boxed{12}$ $\boxed{12}$		2		2
3.00-3.24				△12A					$\boxed{12}$			1	1	2
2.75-2.99						③			② ⑦	③ $\boxed{12}$	4	1		5
2.50-2.74			③ ⑫		③	⑪					4			4
2.25 2.49			△12*	⑤			⑦⑦⑧		$\boxed{12}$ $\boxed{12}$	⑩ $\boxed{12}$	5	3	1	9
2.00-2.24		⑫	$\boxed{12}$			⑦ △12A	⑬	△12A	⑫	④	5	1	2	8
1.75 1.99					③ ⑤	$\boxed{12}$		⑩		③ ⑥	5	1		6
1.50-1.74		⑦	⑥		⑤	⑧			⑤		5			5
1.25-1.49		②		②	⑨	③			⑧		5			5
1.00-1.24				⑥		⑦	③				3			3
.75-.99			⑥								1			1
.50-.74														
.25-.49														
0-.24						①					1			1
Total non Grad		3	4	3	5	7	5	1	5	5	38			
Total C-J Grad			1			1			3	4		9		
Tot non C-J Grad			1	1		1		1					4	
GRAND TOTAL		3	6	4	5	9	5	2	8	9				51

CHAPTER VI

THE COLLEGE OF EDUCATION

There were 197 freshman entrants to the College of Education in the Autumn Quarter of 1923. Of these, 163 were women and 34 men. The college is a professional college in which the men and women follow essentially the same curriculum. Since the data presented show no marked sex differences,* the 197 cases will be treated as a single group.

PERSISTENCE, ELIMINATION, AND GRADUATION

Table 53 shows the persistence from quarter to quarter of the 197 entrants by calendar quarters and the ordinal numbers of quarters of work completed. Of the 197 entrants, 4 completed no work at all; thus the total for the first vertical column of the table shows that only 193 completed at least one quarter. The next column total shows that 183 completed at least 2 quarters, 175 at least 3 quarters, and so on. The totals are also given in per cents of the 197 original entrants. It is shown that 88.8 per cent completed at least 3 quarters of work; 67.5 per cent at least 6 quarters; 53.8 per cent at least 9 quarters; and 39.1 per cent at least 12 quarters.

The second column from the right end of the table shows the numbers of students completing work at the end of each specified calendar quarter. These totals are shown as per cents of the 197 who entered in the Autumn of 1923. Of the 197 entrants, 83.8 per cent completed work in the Spring Quarter of 1924; 64.5 per cent in the Spring Quarter of 1925; 53.8 per cent in the Spring Quarter of 1926; and 44.2 per cent in the Spring Quarter of 1927.

GRADUATION

Of the 197 entrants, 69 (35.0 per cent) had secured degrees by June 1927. Of these 69 persons to whom degrees were granted, 58 were given degrees by the College of Education, 3 by the College of Agriculture, 3 by the College of Commerce, and 5 by the College of Arts. Two of those receiving an Education degree also received an Arts degree. Three students continued in school after receiving a bachelor's degree before the end of the four-year period. The two men transferred to the Graduate School and completed 1 and 3 quarters respectively. One student (a woman) completed 2 more quarters of work in the College of Education.

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*Men and women were kept separate in the original computations, but were combined later.

PROBABLE ULTIMATE GRADUATION

In all, 25 completed at least 10 quarters of work and did not receive degrees. The number of credit hours still to be obtained by the 25 students in order to graduate from the college in which they were last enrolled (assuming that all the hours for which they are credited are applicable for a degree in the college in which they were registered at the last time of record) are shown in Table 54.

Table 55 shows the distribution of point-hour-ratios of these 25 students. Four of the 25 had point-hour-ratios of less than 1.8, the minimum required for graduation from the University. It is quite probable that 12 will graduate with one more quarter of work, and perhaps 8 more upon the completion of two more quarters of work. Hence the per cent of the College of Education entrants who will probably ultimately graduate would be raised on such an estimate, from 35 per cent to 45 per cent.

TRANSFERS

Table 56 shows the numbers of students who transferred from the College of Education to other colleges in the University. Most of the transfers, 20 out of 25, were to the Colleges of Commerce and of Arts, 10 each. Of the 25 who transferred from the College of Education, nine made a second transfer and one a third transfer. Of these nine second transfers, four returned to the College of Education, two went into the Graduate School, and one each to Medicine, Arts-Education, and Arts. The one student making three transfers changed first to Commerce after completing two quarters in Education, then back to Education after one quarter in the College of Commerce, and finally to Arts at the end of his fifth quarter. It is of interest to note that of the 25 transfers, 19 (or 76 per cent) were made after completing only two or three quarters of work in the College of Education.

ENTRANCE CONDITIONS

Of the 197 students who entered the College of Education in the Autumn of 1923, 15 had a one-unit entrance condition in plane geometry. These 15 students comprise all who entered with conditions. The average attainment of this group in terms of both point-hour-ratio at last time of record and of persistence is below that of the average. The average point-hour-ratio of the 15 having conditions was 1.66; and the average persistence was 5.8 quarters. The average point-hour-ratio of the 193 who completed one or more quarters was 2.02 which is distinctly higher than 1.66. The 197 entrants persisted on the average 8.66 quarters, nearly 3 quarters longer than those who had conditions at entrance. The average intelligence test percentile of the 197 entrants was 47.2. The average intelligence test percentile of the 15 who had entrance conditions was 37.7

PREDICTION OF SCHOLASTIC ACHIEVEMENT

The interrelations of the Intelligence Test percentile, the cumulative point-hour-ratio, persistence, and graduation is shown in Table 57. The notation of the table is as follows:

1. Each square, circle, and triangle represents one student.
2. A circle shows that that student had not graduated within the four-year period.
3. A Square indicates that that student received a degree in the College of Education by June 1927.
4. A triangle followed by a letter shows that that student received a degree in some college other than Education. The letter, or letters, following the triangle designates the college granting the degree:

   Ag — Agriculture
   A — Arts
   C — Commerce
5. The numbers inside the circles, squares, and triangles show the number of quarters of work completed by that individual.
6. Any other notations are explained in a footnote to the table.

The records of the four students who completed no work do not appear in Table 57 since they have no point-hour-ratio.

It can be readily seen from Table 57 that there is a distinct positive relationship between the Intelligence Test percentile and scholarship at the last time of record; that is, the cumulative point-hour-ratio for the entire college course of an individual (so far as recorded during the first four years of possible attendance). By means of such a table as Table 57, the Intelligence Test percentile can be used to predict the quality of work that a student will probably do. The correlation between intelligence and four year's record is .54.

A considerably better prediction of point-hour-ratio can be made if the Entrance Board's Estimate of the high-school record be added to the Intelligence Test score. (The correlation of test score and high-school record with point-hour-ratio becomes .67 when the test score and high-school record are optimally weighted.)

Figure 27 shows the proportions of the entrants of the varying Intelligence Test percentiles who graduated. This graph may be used as a "probability of graduation" table: A student making an Intelligence Test score of 10 percentile or lower has about 20 chances in 100 of graduating; if of 90 percentile or above, 53 chances in 100 of graduating. Or, if X is the Intelligence Test percentile, the equation

$$Y=0.368X+18.682$$

gives the chances in 100 that the entrant having the percentile X, will graduate. This is the straight line shown in Figure 27.

The perseverance or length of stay in school shows little relation to the Intelligence Test score. Persistence shows practically no relationship to the Entrance Board's Estimate of the high-school record. The best measure now available for the prediction of persistence is the first quarter point-hour-ratio. This, however, correlates only .41 with persistence.

As a measure of the educational product, both quality of work and persistence, cumulative credit hours and cumulative credit points may be used. Figure 28 shows the average cumulative credit hours earned by students having different Intelligence Test percentiles. At the end of the first quarter there is very little difference in the average number of credit hours possessed by students with different Intelligence Test scores; at the end of the second quarter, those of higher Intelligence Test scores have gained some over those who have lower test scores. This difference becomes greater and greater as time goes on, so that at the end of the fifteenth possible quarter of school work, those in the 91-100 percentiles have on the average about 1.7 times the number of credit hours possessed by those having Intelligence Test percentiles 1-10. The graph also shows a very distinct drop in average credit hours between the 11-20 percentiles and 1-10 percentiles.

Figure 29 shows the average cumulative points earned by students having different Intelligence Test scores. There is a noticeable difference in average number of points at the end of the first quarter. Those students who have high Intelligence Test scores had about twice as many points as those who have low test scores. After the end of the third quarter the highest intelligence group have on the average over 2.5 times as many points as the lowest group. This ratio remains greater than 2.5 for the rest of the 15 possible quarters of attendance. The differences in the accomplishments of the 11-20 percentile students and the 1-10 percentile students is shown quite distinctly in Figure 29. The differences of attainment are much more noticeable in Figure 29 than in Figure 28.

Table 58 shows the differences in attainment of the students whose Intelligence Test score is in the highest decile (91-100 percentiles) and those in the lowest decile (1-10 percentiles) in greater detail. The "Relative Efficiency" is the ratio of the attainment of the highest decile students to the lowest decile students.

SUMMARY AND CONCLUSIONS

1. In the Autumn Quarter 1923-24, 197 Freshmen entered the College of Education.
2. Of the 197 entrants, 88.8 per cent finished at least 3 quarters of work, 67.5 per cent completed at least 6 quarters, and 53.8 per cent completed at least 9 quarters of work.

3. By June 1927, 69 (35.0 per cent of the original entrants) graduated. Of these 69, 58 were graduated from the College of Education and 11 from other colleges of the Ohio State University. Of those who had not received degrees, 20 could probably graduate upon the completion of 1 or 2 quarters of additional work, making the proportion of entrants of the College of Education who ultimately may be expected to graduate 45 per cent instead of 35 per cent.
4. There were 25 students who transferred out of the College of Education. Of these, 10 went to the College of Commerce and 10 to the College of Arts. Four of the 25 ultimately transferred back to the College of Education.
5. The academic success of those having high Intelligence Test scores is greater than those having low Intelligence Test scores. Not only is the quality of work better, but a larger proportion of those who have high Intelligence Test scores graduate than those having low Intelligence Test scores.

TABLE 53

BASIC PERSEVERANCE-ELIMINATION TABLE OF EDUCATION STUDENTS

Number of Quarters of Possible Attendance	End of Calendar Quarter		Number of Persons Who, at the End of the Quarter Specified at the Left Margin, Completed the Following Designated Ordinal Quarters of Work (Actual Number of Quarters Completed)															Completed Work in Designated Quarter	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	Per Cent
1	1923-24	A	191															191	97.0
2		W	1	177														178	90.4
3		S		4	161													165	83.8
4		Su			2	25												27	13.7
5	1924-25	A	1	1	8	112	20											142	72.1
6		W		1	2	14	98	20										135	68.5
7		S			2	1	16	89	19									127	64.5
8		Su						4	8	11								23	11.7
9	1925-26	A				3	6	10	72	11	7							109	55.3
10		W					3	6	11	71	11	6						108	54.8
11		S						3	5	10	70	12	6					106	53.8
12		Su							2	3	4	10	4	1				24	12.2
13	1926-27	A						1	4	2	8	58	16	6				95	48.2
14		W							1	4	2	7	56	16	5			91	46.2
15		S								1	4	1	7	54	16	4		87	44.2
Entrants Who Completed at Least the Ordinal Numbers of Quarters Designated	Number		193	183	175	155	143	133	122	113	106	94	89	77	21	4			
	Per Cent		98.0	92.9	88.8	78.7	72.6	67.5	61.9	57.4	53.8	47.7	45.2	39.1	10.7	2.0			
Entrants Not Completing at Least the Ordinal Numbers of Quarters Designated	Number		4	14	22	42	54	64	75	84	91	103	108	120	176	193			
	Per Cent		2.0	7.1	11.2	21.3	27.4	32.5	38.1	42.6	46.2	52.3	54.8	60.9	89.3	98.0			

TABLE 54

CREDIT HOURS STILL TO BE EARNED BY STUDENTS OF TABLE 55

Credit Hours to be Gained for Degree**	Number of Students
1–10	8
11–20	4
21–30	4
31–40	4
41–50	2
51–60	1
61–70	
71–80	1
Total*	24

* One case is omitted since that student transferred to Medicine and has completed only one year of work in the Medical School.

** Provided all credits possessed are applicable toward the degree sought.

TABLE 55

CUMULATIVE POINT-HOUR-RATIOS OF NON-GRADUATING STUDENTS

Cumulative Point-Hour-Ratio at the Time of Last Record	Number of Such Students Persisting at Least Ten Quarters
2.75–2.99	1
2.50–2.74	6
2.25–2.49	5
2.00–2.24	1
1.75–1.99	9*
1.50–1.74	2
1.25–1.49	1
Total	25

* One of these nine students has a point-hour-ratio lower than 1.8, the minimum required for graduation.

TABLE 56

DISTRIBUTION OF TRANSFERS

To the College of	Number of Students Who Transferred out of the College after the following numbers of Quarters of Attendance in the Education College									Total
	1	2	3	4	5	6	7	8	9	
Agriculture ...		1	3	1						5
Arts		3	5							8
Arts—Educ. ...			1					1		2
Commerce		5	1			2		1	1	10
Total		9	10	1		2		2	1	25
Cum. No.......		9	19	20	20	22	22	24	25	
Cum. Per Cent		36.0	76.0	80.0	80.0	88.0	88.0	96.0	100.0	

TABLE 57

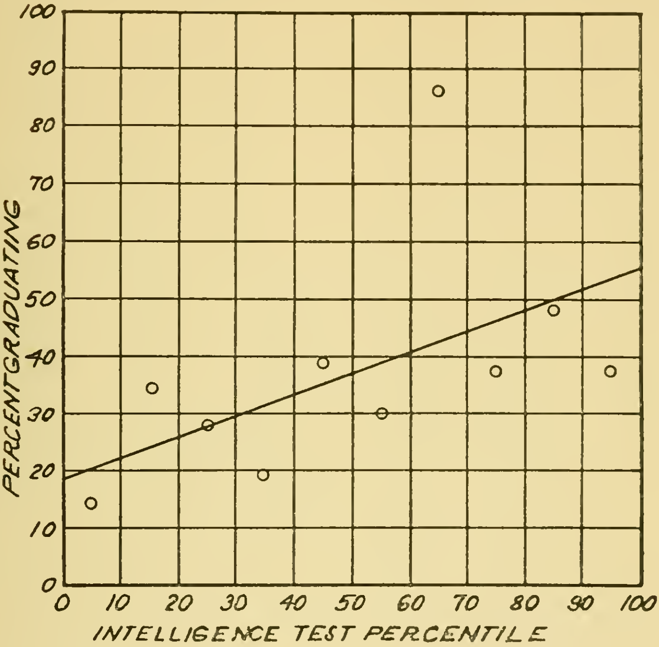
BASIC FOLLOW-UP TABLE SHOWING THE INTERRELATIONS OF INTELLIGENCE, POINT-HOUR-RATIO, QUARTERS OF PERSISTENCE, AND GRADUATION

Cum. Point Hour Ratio at Last Time of Record	Intelligence Test Percentile 1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Total NonGrad.	Total Educ.Grad.	Tot.NonEducGrad.	GRAND TOTAL
3.75-3.99											0	0	0	0
3.50-3.74								$\boxed{13}$ $\boxed{12}$	◠12	$\boxed{10}$ ⑥	1	4	0	5
3.25-3.49						$\boxed{11}$ $\boxed{12}$			$\boxed{11}$ $\boxed{11}$	③	1	4	0	5
3.00-3.24				$\boxed{13}$		$\boxed{12}$	$\boxed{12}$ ⏢13	⑨	$\triangle 12^{Ag}$	$\triangle 12^{A}$ ⑨ $\triangle 12^{C}$	2	4	3	9
2.75-2.99	$\boxed{12}$		$\boxed{12}$		$\boxed{12}$		$\boxed{13}$ ⑫	③ ⑥	$\boxed{12}$	⑥ ③ $\boxed{12}$ $\triangle 12^{A}$	5	6	1	12
2.50-2.74		⑨	$\boxed{12}$ ④ ⑪	⑩	⑪ ⑨ $\boxed{12}$	⑦ ⑩ ⑪ $\boxed{12}$	$\boxed{12}$ $\boxed{12}$ $\triangle 12^{A}$ $\boxed{12}$	$\boxed{12}$ $\boxed{12}$ ⑪ $\triangle 13^{C}$		$\boxed{12}$	10	9	2	21
2.25-2.49		$\boxed{13}$	$\boxed{13}$ $\boxed{12}$ ⑥ ③	⑥	⑪ $\triangle 12^{C}$ $\boxed{12}$ $\boxed{12}$ $\triangle 12^{C}$	①	$\boxed{12}$ $\boxed{12}$ $\boxed{13}$ ⑩	③ ⑪ ② ⑧ ⑩ ⑫ $\triangle 12^{A}$ $\boxed{12}$ $\boxed{12}$	$\boxed{13}$ $\boxed{12}$	⑥	13	12	3	28
2.00-2.24	$\boxed{12}$ $\boxed{13}$	$\boxed{12}$ $\boxed{12}$ $\boxed{12}$ $\boxed{13}$	$\boxed{13}$ $\boxed{12}$ $\boxed{12}$ ⑤ ⑤	$\boxed{12}$ $\triangle 12^{A}$ ⑪ ⑧	① ⑦ $\boxed{13}$	⑤ ① $\boxed{12}$	$\boxed{12}$ $\boxed{12}$ $\boxed{14}$	① ⑥ $\boxed{12}$	⑨ ⑦ ⑤ $\triangle 12^{A}$		13	16	2	31
1.75-1.99	⑦ ⑪ ⑧ $\boxed{12}$	⑫ ⑬ ⑫	⑫	⑦ ④ ④ ③	②	③ $\boxed{14}$		⑫ ⑨ ⑦	⑥ ④ ⑪ $\boxed{14}$ ⑫		20	3	0	23
1.50-1.74	⑨ ① ⑤	⑧	⑬ ⑦ ②	⑧ ③		⑧				⑫	11	0	0	11
1.25-1.49	④ ⑨ ③ ⑨ ⑥ ④		⑤ ⑧	⑨	⑫ ⑥ ⑬	⑨ ③ ④ ③ ⑤			③	⑧	19	0	0	19
1.00-1.24	③ ④ ⑤ ⑤ ⑥	⑦ ④ ③ ②	⑦		②					③	12	0	0	12
.75-.99	② ① ③	③ ③	③ ④ ⑤							④	9	0	0	9
.50-.74	① ④		②	③							4	0	0	4
.25-.49											0	0	0	0
.00-.25	① ②		①		①						4	0	0	4
Total Non Grad.	24	11	18	12	11	13	2	15	8	10	124			
Total Educ. Grad.	4	5	7	2	5	6	12	7	7	3		58		
Tot. NonEduc Grad.	0	0	0	1	2	0	1	2	2	3			11	
GRAND TOTAL	28	16	25	15	18	19	15	24	17	16				193

FOOTNOTE: The student represented by a rectangle (Intelligence Test Percentile 71-80, Point-Hour-Ratio 3.51-3.74, persistence 13 quarters) completed two quarters of work after graduation. The student represented by a semicircle and the student represented by the trapezoid each received both the A.B. and B.Sc. degrees.

FIGURE 27

PER CENT OF 197 ENTRANTS OF THE VARIOUS INTELLIGENCE TEST PERCENTILES WHO GRADUATED BY JUNE, 1927



N 28 17 25 16 18 20 16 24 17 16

The Equation for a straight line is $Y = 18.682 + 0.368X$

Footnote: The classes used here were 1-10, 11-20, etc., and the corresponding mid-values were 5.0, 15.0, etc., respectively.

FIGURE 28

The Average Progress in Cumulative Hours Made by Students at Each Intelligence Test Percentile, Quarter by Quarter, for 15 Successive Quarters

N = 197

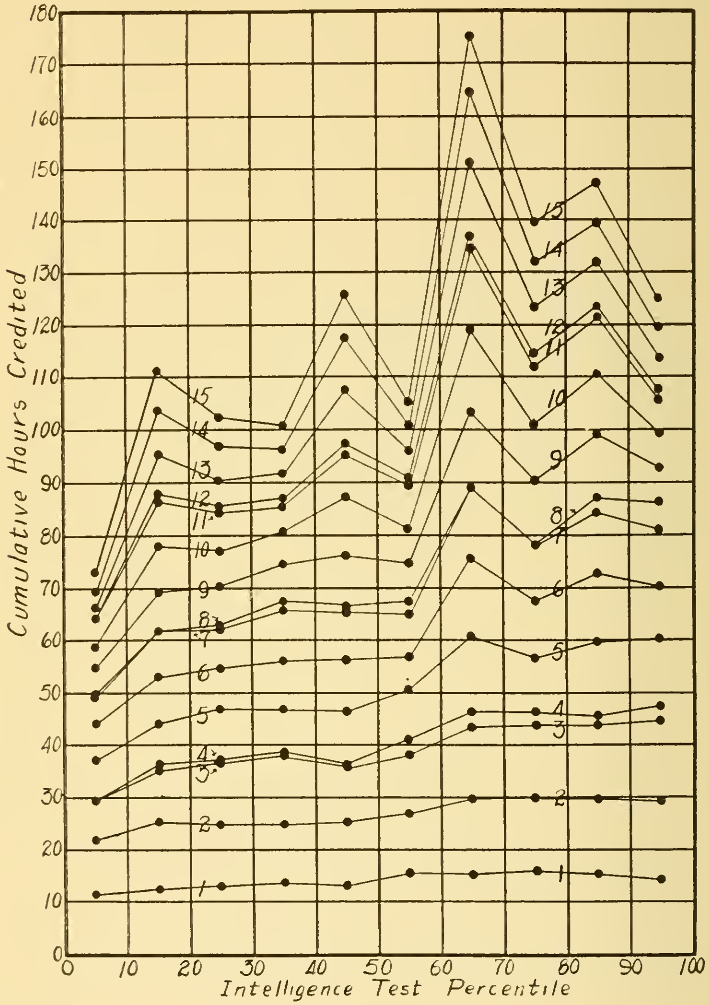


FIGURE 29

THE AVERAGE PROGRESS IN CUMULATIVE POINTS MADE BY STUDENTS AT EACH INTELLIGENCE TEST PERCENTILE, QUARTER BY QUARTER FOR 15 SUCCESSIVE QUARTERS

N = 197

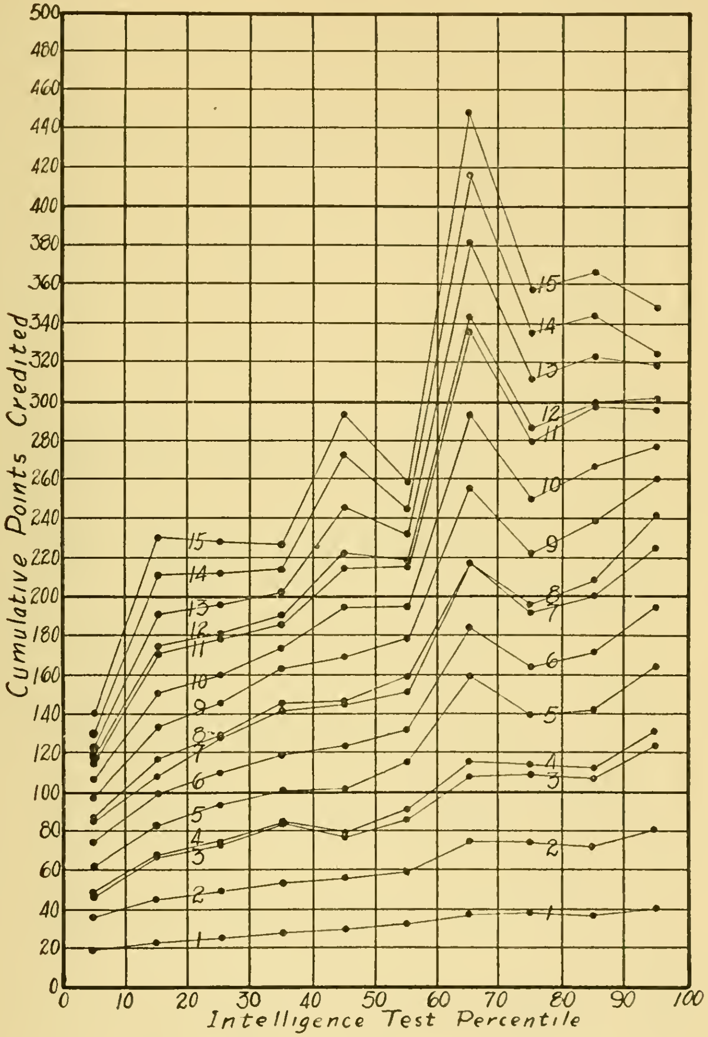


TABLE 58

AVERAGE ATTAINMENTS OF THE 1-10 PERCENTILE STUDENTS AND THE 91-100 PERCENTILE STUDENTS

Number of Quarters of Possible Attendance	End of Calendar Quarter	Average Credit on the Registrar's Books at the End of the Quarter Designated											
		Average Cumulative Hours Credited		Relative Efficiency	Average Cumulative Points		Relative Efficiency	Average Hours Per Quarter Earned in the Quarter Designated		Relative Efficiency	Average Points Per Quarter Earned in the Quarter Designated		Relative Efficiency
		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile	
0	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1923-24 A	11.6	14.2	1.22	19.6	40.2	2.05	11.6	14.2	1.22	19.6	40.2	2.05
2	W	22.1	29.4	1.33	36.0	80.9	2.25	10.5	15.2	1.45	16.4	40.7	2.48
3	S	29.2	44.7	1.53	47.7	124.4	2.61	7.1	15.3	2.15	11.7	43.5	3.72
4	Su	29.4	47.5	1.62	48.1	132.2	2.75	.2	2.8	14.00	.4	7.8	19.50
5	1924-25 A	37.1	60.2	1.62	61.4	165.6	2.70	7.7	12.7	1.65	13.3	33.4	2.51
6	W	43.8	70.4	1.61	73.6	194.6	2.64	6.7	10.2	1.52	12.2	29.0	2.38
7	S	49.3	81.2	1.65	85.1	226.2	2.66	5.5	10.8	1.96	11.5	31.6	2.75
8	Su	49.8	86.7	1.74	86.6	242.7	2.80	.5	5.5	11.00	1.5	16.5	11.00
9	1925-26 A	54.6	92.9	1.70	97.0	260.5	2.69	4.8	6.2	1.29	10.4	17.8	1.71
10	W	58.7	99.6	1.70	106.6	278.2	2.61	4.1	6.7	1.63	9.6	17.7	1.84
11	S	62.9	105.7	1.68	115.5	296.1	2.56	4.2	6.1	1.45	8.9	17.9	2.01
12	Su	63.2	107.8	1.71	118.1	302.5	2.56	.3	2.1	7.00	2.6	6.4	2.46
13	1926-27 A	66.3	113.7	1.71	123.4	318.2	2.58	3.1	5.9	1.90	5.3	15.7	2.96
14	W	69.6	119.4	1.72	131.2	335.0	2.55	3.3	5.7	1.73	7.8	15.8	2.03
15	S	72.9	124.8	1.71	139.4	348.0	2.50	3.3	5.4	1.64	8.2	14.0	1.71

CHAPTER VII

THE COLLEGE OF PHARMACY

The College of Pharmacy presents a situation somewhat different from that of the other colleges of the Ohio State University. The following paragraph from the 1927-28 Bulletin of the College of Pharmacy shows the situation fairly well:

> The Ohio Pharmacy Law requires, as a condition of registration as Pharmacist, that the candidate shall be a citizen of the United States, shall be twenty-one years of age, shall have had two years of practical experience, and shall be a graduate from a recognized college of pharmacy. A student who has taken a course in pharmacy longer than the two years prescribed by law may count each additional year of college work successfully completed as one year of practical experience required.

These requirements will be referred to later in the study.

PERSISTENCE, ELIMINATION, AND GRADUATION

Table 59 shows the persistence of the 88 students who entered the College of Pharmacy as freshmen in the Autumn Quarter of 1923. Outstanding facts presented by this table are as follows: Of the 88 students who entered in the Autumn Quarter, 77 completed work the following Spring Quarter (Spring Quarter 1924) and 66 were still in school during the Spring Quarter 1925. Only 30 returned in the Autumn Quarter of 1925. Most of those who studied pharmacy completed only the minimum two years of college work prescribed by law.

It is also shown that 84 completed at least one quarter of work, 83 at least two quarters of work, 81 at least three quarters of work, 69 at least 6 quarters, and only 36 at least 7 quarters of work. The persistence according to numbers of quarters of work completed is better shown in Figure 30. There was little elimination during the first six quarters (78.4 per cent completed at least 6 quarters), much less elimination than in any of the other colleges of the University. After the sixth quarter there was a very decided dropping out. Only 40.9 per cent completed at least 7 quarters.

Table 59 also shows that there was very little retardation during the first two years (1923-24 and 1924-25). Of the 88 who entered, 83 completed their first quarter of work during the Autumn Quarter of 1923; 79 completed their second quarter of work during the Winter Quarter 1923-24; 77 completed their third quarter during the Spring Quarter 1923-24; and so on. If three quarters be considered a "normal" year's work, then the numbers enclosed in the boxes along the diagonal of the table show the number of students who made just normal progress. Those cases to the right and above the diagonal were accelerated (had done more than 3 quarters of work each calendar year). During the first year there was no retardation, and very little retardation during the second year. Those cases to the left and below the diagonal are those which were retarded (had done less than 3 quarters of work each calendar year).

GRADUATION

Of the 88 students who entered the College of Pharmacy, 48 (54.5 per cent) received the certificate in Pharmacy.* Table 60 shows that 30 of the 48 certificates were issued at the end of the Spring Quarter 1924-25. Twenty-nine received certificates at the end of their sixth quarter of work, of which 28 were granted at the close of the Spring Quarter 1924-25; 9 received certificates at the end of their seventh quarter; 4 at the end of the eighth; 5 at the end of the ninth quarter; and one at the end of the tenth quarter.

Only one of the 88 received a degree. The student receiving a degree transferred to the College of Commerce and at the end of the Spring Quarter 1926-27, his twelfth quarter, received the degree B. Sc. in Business Administration.

ENTRANCE CONDITIONS

Only four of the 88 entrants had conditions in any high-school work at the time of entrance to the University. These four students each had one unit condition in plane geometry. Only one had an Intelligence Test percentile above 16. Their average point-hour-ratio at last time of record was 1.44.

TRANSFERS TO OTHER COLLEGES

Of the 88 who entered the College of Pharmacy only 6 transferred to other colleges in the Ohio State University. Table 61 shows the time of each transfer and the college to which each transfer was made. Six students transferred out of the College of Pharmacy, all before the beginning of their third year of work.

PREDICTION OF SCHOLASTIC ATTAINMENT

Table 62 shows the relationship between the Intelligence Test percentile and scholarship (point-hour-ratio) at the last time of record. The notation of Table 62 is as follows:

1. Each circle, square, or triangle represents one student.
2. A circle shows that that student received no certificate or degree from the Ohio State University during the four-year period.

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*The certificate in Pharmacy is issued upon satisfactory completion of the two-year curriculum in Pharmacy.

3. Each case represented by a square received a certificate in pharmacy.
4. The student represented by a triangle with the letter C received a degree in the College of Commerce.
5. The number inside each circle, square, or triangle is the number of quarters of work that that individual completed in the four-year period.

The column "Intelligence Test percentile 1-10" shows the lowest average point-hour-ratio and also the lowest proportion of graduates. The column "Intelligence Test Percentile 91-100" shows not only the highest average scholarship, but also the largest proportion of graduates.

The relationship in general between point-hour-ratio and the Intelligence Test is indicated by the correlation coefficient .44. A better prediction of scholarship in that college could probably be obtained by the use of tests of a more specific nature.

The estimate of scholarship made at entrance can be bettered some by adding the Entrance Board's Estimate of the high-school record to the Intelligence Test score. The correlation of these two measures with point-hour-ratio at the last time of record was .48.

Figure 31 shows the per cents of students of the different Intelligence Test percentiles who received either a certificate or degree. Only a small proportion of those having low Intelligence Test scores received any certificate or degree, while quite a large proportion of those who had a high Intelligence Test score did receive a certificate or degree. The graph may be used to show the probability of obtaining a certificate. A student having a 50 percentile Intelligence Test score had about 60 chances in 100 of securing a certificate. The probability of an entrant of the College of Pharmacy of receiving a degree or certificate Y is given in terms of chances in 100 by the equation

$$Y = .50X + 35.77$$

where X is the Intelligence Test percentile.

Figure 32 shows the average cumulative credit hours at the end of each possible successive quarter for students according to the Intelligence Test percentile. Again the effect of a two-year curriculum is shown. The curves showing the cumulative credit hours for students of different Intelligence Test percentiles are fairly regular for the first 6 quarters, showing fewer credit hours for those who have low test scores and greater number of credit hours for those who have high test scores. The curves above the sixth quarter become more irregular because of low numbers of students involved.

Figure 33 is similar to Figure 32. In Figure 33 average cumulative points are shown. The differences between the educational record of those of different Intelligence Test scores are shown more markedly in this graph.

Table 63 shows the differences in accomplishment of students having Intelligence Test scores of 1-10 percentiles. Such a comparison is valid only up to about the end of the seventh quarter.

Persistence cannot be predicted very well by means of any of the measures suggested for the prediction of scholarships. Persistence shows very little relationship to the Intelligence Test Score and still less relationship to the Entrance Board's Estimate of the high-school record. First quarter marks are also of little value in predicting persistence.

SUMMARY AND CONCLUSIONS

1. In the Autumn Quarter of 1923, 88 students entered the College of Pharmacy. Of these, 84 completed at least one quarter of work.
2. The persistence during the first 6 quarters was exceptionally good, since 69 of the 88 entrants completed at least 6 quarters of work.
3. In all, 48 of the 88 entrants (54.5 per cent) received certificates in Pharmacy in the four-year period. This figure will be raised but little, if any, by subsequent graduation. One student who transferred to the College of Commerce received the degree, B. Sc. in Business Administration.
4. The Intelligence Test percentile can be used to predict probability of graduation.
5. Those having high Intelligence Test scores do markedly better school work in terms of both hours credited and points than do those having low Intelligence Test Scores.
6. Persistence shows little relation to Intelligence Test scores, Entrance Board's Estimate of high-school record, or Scholarship.

TABLE 59

BASIC PERSEVERANCE-ELIMINATION TABLE OF PHARMACY STUDENTS

Number of Quarters of Possible Attendance	End of Calendar Quarter		Number of Persons Who, at the End of the Quarter Specified at the Left Margin, Completed the Following Designated Ordinal Quarters of Work (Actual Number of Quarters Completed)															Completed Work in Designated Quarter	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	Per Cent
1	1923-24	A	83															83	94.3
2		W		79														79	89.8
3		S			77													77	87.5
4		Su				3												3	3.4
5	1924-25	A		1	2	64	3											70	79.5
6		W				3	64	3										70	79.5
7		S		1		1	3	58	3									66	75.0
8		Su							1									1	1.1
9	1925-26	A	1			2		4	22	1								30	34.1
10		W		1			3		7	18								29	33.0
11		S		1	1			3	1	2	14							22	25.0
12		Su				1					1	2						4	4.5
13	1926-27	A			1	1	1		1	2	2	8	2					18	20.5
14		W				1	1	1		1	2	3	6	2				17	19.3
15		S							1			1	3	6	1			12	13.6
Entrants Who Completed at Least the Ordinal Numbers of Quarters Designated	Number		84	83	81	76	75	69	36	24	19	14	11	8	1				
	Per Cent		95.5	94.3	92.0	86.4	85.2	78.4	40.9	27.3	21.6	15.9	12.5	9.1	1.1	0			
Entrants Not Completing at Least the Ordinal Numbers of Quarters Designated	Number		4	5	7	12	13	19	52	64	69	74	77	80	87	88	88		
	Per Cent		4.5	5.7	8.0	13.6	14.8	21.6	59.1	72.7	78.4	84.1	87.5	90.9	98.9	100.0	100.0		

FIGURE 30

PER CENTS OF ENTRANTS WHO COMPLETED AT LEAST 1, 2, 3 .... 15 QUARTERS OF WORK

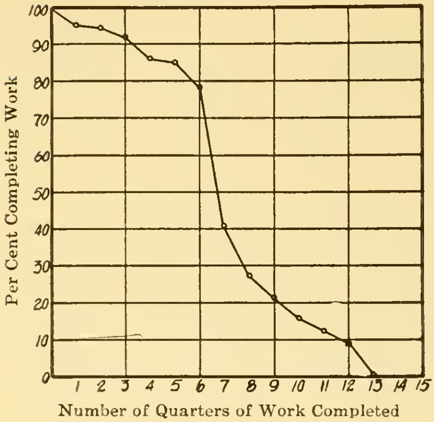

TABLE 60

QUARTERS OF WORK OF PHARMACY GRADUATES

Calendar Quarter		Number of Quarters Work Completed					Number Receiving Certificates at End of the Given Calendar Quarter	Per Cent Receiving Certificates at End of Calendar Quarter
		6	7	8	9	10		
1924-25	S	28	2				30	34.1
	Su		1				1	1.1
1925-26	A		1				1	1.1
	W		5	3			8	9.1
	S	1			4		5	5.7
	Su							
1926-27	A					1	1	1.1
	W			1	1		2	2.3
	S							
Number Receiving Certificates		29	9	4	5	1	48	54.5
Per Cent Receiving Certificates		33.0	10.2	4.5	5.7	1.1	54.5	

TABLE 61

Distribution of Transfers

To the College of	Number of Students Who Transferred Out of the College after Completing the Following Number of Quarters of Attendance in Pharmacy							Total
	0*	1	2	3	4	5	6	
Arts					1			1
Commerce	1	2						3
Education				1			1	2
Total	1*	2		1	1		1	6
Cum. Number	1	3	3	4	5	5	6	
Cum. Per Cent	16.7	50.0	50.0	66.7	83.3	83.3	100.0	

* This student originally entered in Pharmacy, withdrew before completing any work, and on his return entered the College of Commerce.

TABLE 62

BASIC FOLLOW-UP TABLE SHOWING THE INTERRELATIONS OF INTELLIGENCE, POINT-HOUR-RATIO, QUARTERS OF PERSISTENCE, AND GRADUATION

		Intelligence Test Percentile										Total Non Grad	Total Phar Grad	Tot Non Phar Grad	GRAND TOTAL
		1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100				
Cum Point Hour Ratio at Last Time of Record	375-3.99						$\boxed{6}$						1		1
	350-3.74														
	325-3.49			$\boxed{6}$						⑫	$\boxed{6}$ $\boxed{6}$	1	3		4
	3.00-3.24			$\boxed{7}$	$\boxed{6}$	$\boxed{6}$							3		3
	2.75-2.99		$\boxed{6}$	⑪	$\boxed{6}$			$\boxed{6}$	⑫	$\boxed{6}$	$\boxed{7}$	2	5		7
	2.50-2.74		$\boxed{6}$		$\boxed{6}$	$\boxed{6}$	$\boxed{6}$ $\boxed{6}$	$\boxed{6}$	$\boxed{6}$	$\boxed{6}$	$\boxed{6}$		9		9
	2.25-2.49			$\boxed{6}$	⑫ $\boxed{6}$		⑫	$\boxed{6}$ $\boxed{9}$	△12		⑥	3	4	1	8
	200-224	⑫	⑦ $\boxed{6}$	$\boxed{8}$	$\boxed{6}$			$\boxed{6}$	$\boxed{6}$	$\boxed{6}$	$\boxed{8}$	2	7		9
	1.75-1.99	⑥ $\boxed{9}$ ⑤ $\boxed{7}$	$\boxed{6}$ $\boxed{7}$ $\boxed{6}$ $\boxed{9}$ $\boxed{9}$		$\boxed{10}$	$\boxed{6}$ $\boxed{7}$	$\boxed{7}$ $\boxed{7}$	③ $\boxed{9}$		$\boxed{8}$		3	14		17
	1.50-1.74		⑪		⑪	$\boxed{7}$	⑬		$\boxed{10}$			3	2		5
	1.25-1.49	⑧		④	⑤ ⑦			⑩ ⑫				6			6
	1.00-1.24			⑤						⑤		2			2
	.75-.99	⑥	③		③							3			3
	.50-.74	① ②	⑤ ⑥		③	②	⑦					7			7
	.25-.49	③ ⑤ ⑦										3			3
	.00-.25														
Total Non Grad		10	5	3	6	1	3	3	1	2	1	35			
Total Phar Grad		2	8	4	6	5	5	6	3	4	5		48		
Tot Non Phar Grad									1					1	
GRAND TOTAL		12	13	7	12	6	8	9	5	6	6				84

FIGURE 31

Per Cent of 88 Entrants According to Intelligence Test Percentile Who Received Certificates or Degrees

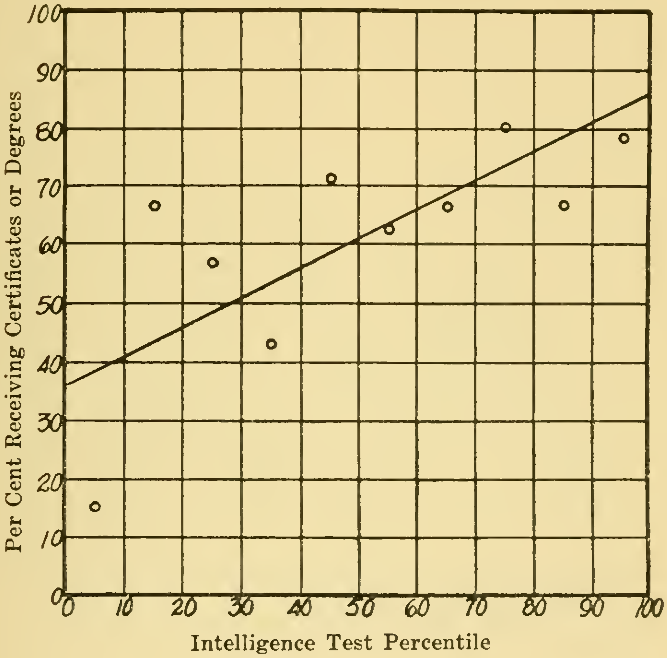

FIGURE 32

The Average Progress in Cumulative Hours Made by Students at Each Intelligence Test Percentile, Quarter by Quarter, for 15 Successive Quarters

N = 88

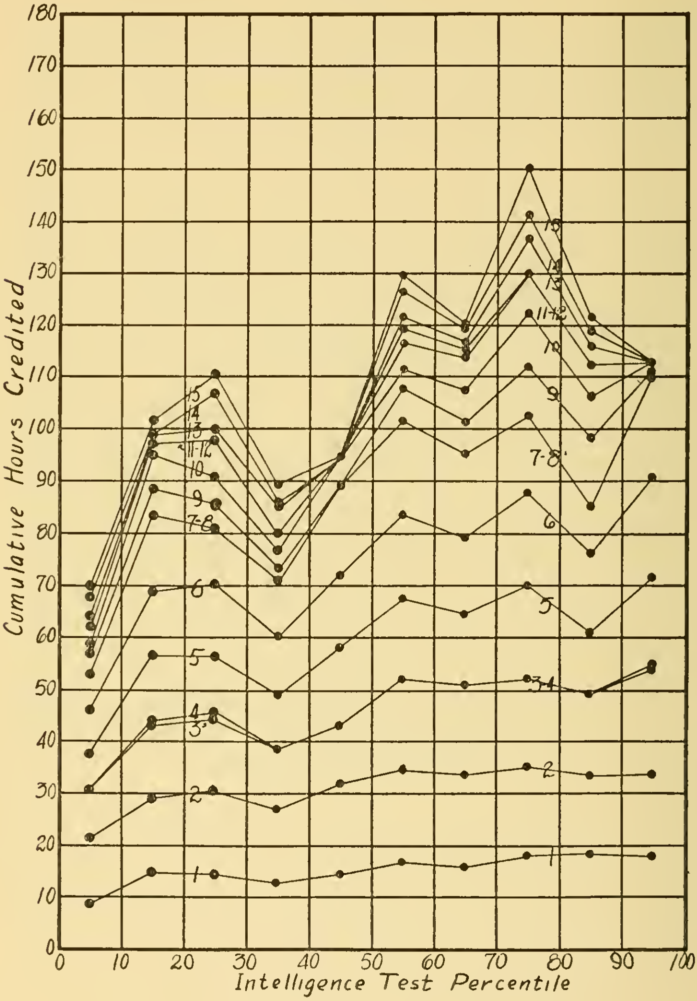

FIGURE 33

THE AVERAGE PROGRESS IN CUMULATIVE POINTS MADE BY STUDENTS AT EACH INTELLIGENCE TEST PERCENTILE, QUARTER BY QUARTER FOR 15 SUCCESSIVE QUARTERS

N = 88

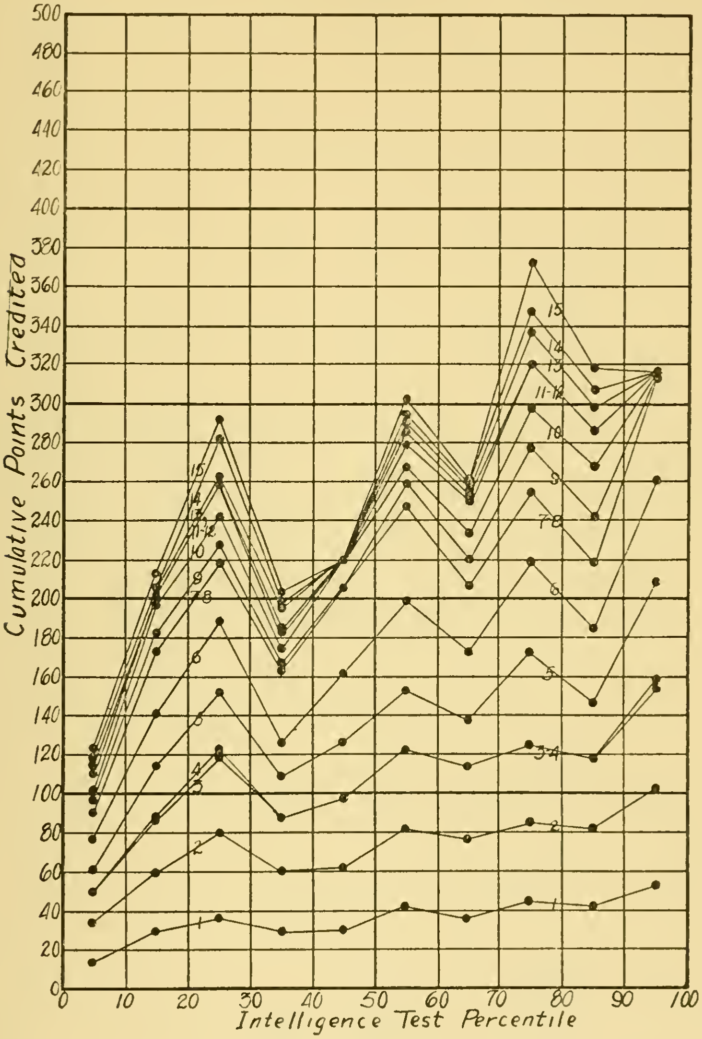

TABLE 63

AVERAGE ATTAINMENTS OF THE 1-10 PERCENTILE STUDENTS AND THE 91-100 PERCENTILE STUDENTS

Number of Quarters of Possible Attendance	End of Calendar Quarter	Average Credit on the Registrar's Books at the End of the Quarter Designated											
		Average Cumulative Hours Credited		Relative Efficiency	Average Cumulative Points		Relative Efficiency	Average Hours Per Quarter Earned in the Quarter Designated		Relative Efficiency	Average Points Per Quarter Earned in the Quarter Designated		Relative Efficiency
		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile		1-10 Percentile	91-100 Percentile	
0	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1923-24 A	8.7	18.2	2.09	13.5	54.2	4.01	8.7	18.2	2.09	13.5	54.2	4.01
2	W	21.2	33.7	1.59	33.7	101.9	3.02	12.5	15.5	1.24	20.2	47.7	2.36
3	S	30.3	53.8	1.78	49.8	154.2	3.10	9.1	20.1	2.21	16.1	52.3	3.25
4	Su	30.3	54.6	1.80	49.8	157.5	3.16	0	.8	*	0	3.3	*
5	1924-25 A	37.5	71.5	1.91	61.3	209.2	3.41	7.2	16.9	2.35	11.5	51.7	4.50
6	W	46.2	90.6	1.96	76.7	260.2	3.39	8.7	19.1	2.20	15.4	51.0	3.31
7	S	52.8	110.3	2.09	89.9	313.7	3.49	6.6	19.7	2.98	13.2	53.5	4.05
8	Su	52.8	110.3	2.09	89.9	313.7	3.49	0	0	0	0	0	0
9	1925-26 A	56.6	111.8	1.98	97.1	316.1	3.26	3.8	1.5	.39	7.2	2.4	.33
10	W	59.2	112.5	1.90	101.4	316.7	3.12	2.6	.7	.27	4.3	.6	.14
11	S	62.2	112.5	1.81	109.6	316.7	2.89	3.0	0	0	8.2	0	0
12	Su	62.2	112.5	1.81	109.6	316.7	2.89	0	0	0	0	0	0
13	1926-27 A	64.4	112.5	1.75	114.5	316.7	2.77	2.2	0	0	4.9	0	0
14	W	68.0	112.5	1.65	118.0	316.7	2.68	3.6	0	0	3.5	0	0
15	S	70.1	112.5	1.60	123.0	316.7	2.57	2.1	0	0	5.0	0	0

* Indeterminate Values.

CHAPTER VIII

SUMMARY AND CONCLUSIONS

In Table 64 are assembled the more outstanding statistical facts that have been found for each of the colleges studied.

In all, 1,958 students born in English-speaking countries entered the Colleges of Agriculture, Arts, Commerce, Education, Engineering, and Pharmacy of the Ohio State University in the Autumn Quarter of 1923 as freshmen. Of these 1,958 entrants, 1,912 (97.6 per cent) completed at least one quarter of work.

The summary of the persistence and elimination of these students by college and by sex is shown in Tables 65, 66, 67, and 68.

Table 65 shows the number of students who completed work at the end of each of the fifteen successive calendar quarters from the time of entrance, Autumn Quarter 1923, through the Spring Quarter 1927. In Table 66 the same data are shown in terms of per cents of the entrants. The entrants to the College of Pharmacy had the greatest persistence through the first two years. Of the Pharmacy entrants, 75.0 per cent completed work during the Spring Quarter 1924-25 (the last quarter of the students's second year). The best persistence throughout the last two years was shown by the women in the College of Agriculture. With the exception of the College of Pharmacy, they also showed the best persistence throughout the first two years. The elimination-persistence curve (by calendar quarters) for all 1,958 entrants is shown in Figure 34. This curve shows a sort of periodicity. Each calendar year in itself shows some elimination from quarter to quarter, but the maximum elimination occurs between the Spring Quarter and the following Autumn Quarter.

Of those who originally entered the University, 68.6 per cent (about two-thirds of the entrants) completed work during the Autumn Quarter 1924, one calendar year after entrance. Only 49.9 per cent (about one-half) of the entrants returned and completed work during the Autumn Quarter 1925, two calendar years after entrance; and 40.3 per cent of the entrants completed work during the Autumn Quarter 1926, three calendar years after entrance. There were only 35.0 per cent of the original entrants who completed work during the Spring Quarter 1926-27, the normal graduation quarter.

Table 67 shows that 1,912 students completed at least one quarter of work; 1,822 at least two quarters of work; 1,697 at least three quarters of work; and so on. The same data are given in Table 68 in terms of per cents of the original entrants. Of the 1,958

(100.0 per cent) who entered, 97.6 per cent completed at least one quarter of work, 93.0 per cent completed at least two quarters of work, 86.7 per cent completed at least three quarters of work, and so on.

From the Autumn Quarter 1923 through the Spring Quarter 1927, there were fifteen quarters of possible attendance. The normal number of quarters of attendance during this period is assumed to be twelve quarters (three quarters each calendar year). A greater proportion of the Pharmacy students completed at least six quarters (78.4 per cent) than did students of any other group. The students in the College of Engineering ranked second (74.0 per cent completing at least six quarters of work) and the males in the College of Arts were the poorest with respect to persistence (only 56.3 per cent completing at least six quarters of work). The elimination-persistence curve showing the per cents of the 1,958 entrants who completed at least one quarter, at least two quarters, at least three quarters of work, etc., is shown in Figure 35. The proportions of entrants who completed at least one, two, three, etc., quarters of work decreases fairly uniformly. Of those who entered, 86.7 per cent completed at least three quarters of work, 43.6 per cent completed at least nine quarters of work, and only 28.7 per cent completed as many as twelve quarters of work in the 15 quarters of possible attendance. Is such an enormous elimination necessary? It is very evident from the above facts that there is considerable maladjustment between the student and the University. Before steps can be taken to alleviate the situation, a careful analysis of the factors underlying the amounts of persistence and the elimination of students must be completed.

At the present time persistence cannot be predicted well by any of the measures used for predicting scholastic success. Table 64 (Section IX) shows the correlations between Persistence and Intelligence Test percentile (Row 27); persistence and high-school record (Row 28); and persistence and first quarter point-hour-ratio (Row 29). In the prediction of persistence, the number of quarters of work completed was used as a measure of persistence. Neither of the prognostic measures used for the prediction of the point-hour-ratio showed much relationship to the number of quarters of work completed. The Intelligence Test percentile correlated on the average 0.19 with persistence. In the different colleges the correlations between the Intelligence Test percentile and persistence ranged from 0.04 (females, College of Agriculture) to 0.32 (males, College of Arts).

The Entrance Board's Estimate of the high-school record correlated on the average 0.23 with persistence. The lowest correlation was obtained in the College of Pharmacy (0.14) and the highest in the College of Arts, females (0.33).

If the prediction of persistence be postponed until the end of the first quarter, a somewhat better prediction can be made. First quarter point-hour-ratio correlated on the average 0.40 with persistence. The correlations in the different colleges ranged from 0.24 (College of Pharmacy) to 0.54 (males, College of Arts).

There is considerable temporary dropping-out for one or more quarters as evidenced by the retardation figures. Table 69 shows the per cents of students in school during each calendar quarter who were retarded one or more quarters in their school work (had done less than three quarters each calendar year). There was, of course, very little retardation during the first year. During the second and third years of possible attendance, the men in the College of Agriculture showed the greatest retardation of all the college groups, due, probably, to the fact that practical farm experience is required during a spring and summer quarter. The Engineers also show a large amount of retardation during the third and fourth years. The women of all colleges show considerably less retardation than do the men.

The per cent of the students in attendance during a given calendar quarter who were accelerated (had attended more than three quarters each year) in their school work are shown in Table 70. Among the men the amounts of acceleration were *less* than the retardation. The reverse is true for the women. The problem of acceleration and retardation is a part of the problem of persistence and elimination.

As to graduation, Table 64 (Section III) shows that, of the 1,958 entrants, only 354 (or 18.1 per cent) had been graduated by June 1927, fifteen calendar quarters after entrance. Considerable variation was shown in the proportions of the entrants of the different colleges who were graduated. Only 7.1 per cent of the men who entered the College of Arts had graduated. However, a number (40.5 per cent) of the Arts College Entrants had transferred to other colleges such as Law, Medicine, and Dentistry, making it impossible for them to graduate by June 1927. Of the Pharmacy entrants 55.7 per cent graduated. The Pharmacy graduations represent, with only one exception, the completion of the two-year curriculum. A greater proportion of the women graduated, within four years after entrance, than of the men. Since a few additional entrants in all of the colleges might still have a fair expectation of graduation, an estimate was made of the proportions of the entrants of each college who might be expected ultimately to graduate.

Thus our estimate is that we may ultimately expect about 35 per cent of the men who entered the College of Agriculture to graduate; and about 27 per cent of the men who entered the College of Commerce. These estimates for the different college groups varied from 27 to 51 per cent. About 34 per cent of the 1,958 entrants had records such that they might be expected to have realizable ambitions toward graduation.

This estimate, that of all the students who enter the University only about 34 per cent will probably graduate, points quite definitely to the conclusion that there are certainly a number of places where the University and the student are not properly adjusted to each other.

That the students do make some effort to become adjusted is shown by the fact that 23.0 per cent of the entrants transferred out of the college in which they originally entered to some other college of the Ohio State University. Only 3.5 per cent of the entrants made a second transfer. Table 71 shows the numbers of students who transferred to each given college according to the college of original entrance. The College of Commerce and the College of Education received the largest numbers of the transfers. Of all the 451 who transferred, 29.0 per cent went to the College of Commerce and 20.4 per cent to the College of Education. Of all those who transferred, 58.1 per cent (Table 64, Section IV) transferred during their first year, 26.8 per cent during their second year, 12.2 per cent during their third year, and only 2.9 per cent during their fourth year.

Further investigation of the problem of transfer should include a study of such problems as the following:

1. How long do the transferring students persist after transferring, as compared with those not transferring?
2. Is the scholarship better after transfer than before?
3. What are the objective traits and characteristics of those who transfer as compared with those who do not?

At entrance, 12.4 per cent (about one out of every eight) of the students had one half or more units of entrance conditions. With the exception of the College of Engineering, most of those in each college who had any entrance conditions were conditioned in plane geometry, a subject whose importance as a general college prerequisite is as yet undetermined. In practically all of the colleges studied, the scholarship (point-hour-ratio at last time of record) of those who had entrance conditions was lower than that of the entire group. Those who had entrance conditions did not remain in school as long, on the average, as did the entire group. Also the average Intelligence Test percentile of those who had entrance conditions was lower than that of the entire group.

It might be concluded that entrance conditions in themselves do not constitute a serious handicap, but they are, in general, a sign that the students are probably of inferior quality and are not as likely to meet with as great a degree of success in University work as entrants who have no entrance conditions.

Even in the case of an individual student the probability of college success or failure is, with our best methods of making such predictions, far from being an incalculable matter.

Two different measures were used for the prediction of the point-hour-ratio at last time of record: the University Intelligence Test (Forms 3 and 4) and the Entrance Board's Estimate of the high-school record. The average of the correlations of the point-hour-ratio at last time of record with the Intelligence Test percentile was 0.45. The average of the correlations of the point-hour-ratio at last time of record with the Entrance Board's Estimate of the high-school record was 0.44. The two measures are thus apparently of about the same value in predicting scholarship. The test, in later revisions (Forms 5 and 6), showed an average correlation of 0.55* with the point-hour-ratio of the Junior College period (first six quarters).

A combination of the two prognostic measures (Intelligence Test percentile and Entrance Board's Estimate of the high-school record), combined by multiple correlation, correlated on the average 0.56 with the point-hour-ratio at last time of record. This multiple correlation with scholarship (when Forms 3 and 4 are used) is of about the same size as was found by using the later revision of the test alone. It was estimated* that the addition of the high-school record to the later revision of the test would not raise the correlation with scholarship above 0.63, and likely not above 0.60.

Figure 36 shows the distribution of the point-hour-ratio at last time of record according to the three categories of the Entrance Board's Estimate of the high-school record. The two extreme categories "Good" and "Poor" show a fair discrimination between good and poor students, the group "Average" is quite representative of all the entrants.

The relationship between the Intelligence Test percentile and academic achievement is shown in Figure 37. The graph shows the per cents (determined by the vertical width of the bands) according to Intelligence Test percentile of students who entered the Ohio State University as freshmen in the Autumn of 1923, who:

(a) graduated from the college of original entry;

(b) graduated from a transferred-to college;

(c) did not graduate in four years, but work satisfactory (point-hour-ratio of 1.8 or better) at last time of record.

(d) did not graduate in four years, but work unsatisfactory (point-hour-ratio less than 1.8) at last time of record.

The same data are shown in Figure 38 in inverse order, that is, students of the same group who:

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*Edgerton, Harold A., *Academic Prognosis in the University,* unpublished Ph. D. dissertation, The Ohio State University, 1928.

(a) did not graduate in four years, but work unsatisfactory (point-hour-ratio less than 1.8) at last time of record;

(b) did not graduate in four years, but work satisfactory (point-hour-ratio 1.8 or better) at last time of record;

(c) graduated from a transferred-to college;

(d) graduated from the college of original entry.

The two graphs (Figures 37 and 38) show there is some relationship between the Intelligence Test percentile and graduation, since larger proportions of the students who had high test scores graduated than did those whose test scores were low. Of those students who did not graduate, but whose work was satisfactory at last time of record, much larger proportions were found among those students whose test scores were high. The test seems to give a fairly valid prognosis of probable failures. A very large proportion (Figure 38) of those who had low test scores did not graduate and at last time of record had a point-hour-ratio lower than the 1.8 minimum required for graduation; while on the other hand, of those who had high test scores, very few had a point-hour-ratio less than 1.8 at last time of record.

As further measures of scholarship, cumulative hours credited and cumulative points were considered. Figure 39 shows the average cumulative credit hours on record on the registrar's books at the end of fifteen successive possible quarters of attendance for men and women according to Intelligence Test percentile. The curve for the men (solid line) shows that all the men who had a low test rating (142 students, 1-10 percentile) had an average of about 60 hours credited at the end of 15 quarters of possible attendance in the University. Those students who had higher test percentiles earned on the average larger amounts of credit hours during the fifteen quarters of possible attendance. The women, Intelligence Test percentile for percentile, earned on the average greater numbers of hours credited than did the men. Also, those women who had an Intelligence Test percentile between 71 and 80 earned on the average more hours credit than did those who had any other test score, either higher or lower.

Figure 40 shows the average cumulative points on record on the registrar's books at the end of fifteen successive possible quarters of attendance for men and women according to Intelligence Test percentile. The graph shows the same sort of relationships between Intelligence Test percentile and cumulative points for men and women as was shown between the Intelligence Test percentile and hours credited (Figure 39).

The relative attainments of the poorest (as to Intelligence Test score) 10 per cent of students and the best (as to Intelligence Test score) 10 per cent of students show some variation from college to college. The best 10 per cent of student earned on the average from 0.94 to 2.56 times as many credit hours in the fifteen quarters of possible attendance as did the poorest 10 per cent of students. In all, the best 10 per cent of students earned, on the average, 1.78 as many hours credit as did the poorest 10 per cent of students during the fifteen quarters of possible attendance.

The best 10 per cent of students, in the various colleges, earned, on the average, 1.35 to 3.92 times as many points as did the poorest 10 per cent of students during fifteen quarters of possible attendance. The best 10 per cent of students earned on th average 2.46 times as many points as did the poorest 10 per cent of students.

The foregoing study shows that a student who has a low Intelligence Test percentile, a poor high-school record, and entrance conditions has rather poor college prospects.

On the other hand, a student who enters with a high Intelligence Test score, a good high-school record, and no entrance conditions has quite good chances of college success.

The graduation and persistence figures indicate that even the average student has none too good a chance of college success if such success be measured by a diploma.

The analysis indicates that the University is not securing the attainment from the superior students that is clearly possible. This is particularly true in the case of the women.

Assuming that the brightest 10 per cent of students (91-100 percentile on the Intelligence Test) are as much above the average in ability as the 1-10 percentile students are below the average, the superior group is apparently not as superior in their academic attainments as the inferior group are inferior in their scholastic achievements. At the end of fifteen possible quarters of attendance the superior group had on the average, assuming equality of units, 18.1 more hours credited, 95.2 more points, and 0.45 greater point-hour-ratio than did the student of average intelligence. The inferior student (1-10 percentile) had, on the average, 35.8 less hours, 100.4 less points, and 0.64 lower point-hour-ratio than did the student of average intelligence. Some sort of a constructive program with the needs of the superior student in mind should be instituted. The work of one outstanding student cannot be equated to that of any number of inferior students. We have here the problem of equating the output of one motivated genius with that of numbers of inferior students.

TABLE
SUMMARY OF STATISTICAL

I. Number of Cases	1	Number of Entrants............
	2	Number Completing at Least One Quarter of Work..................................
II. Persistence	3	Per Cent Completing 12 Quarters or More....
	4	Per Cent in Attendance in June 1927, Spring Quarter..................................
III. Graduation	5	Per Cent of Entrants Who Graduated in 4 Yrs.
	6	Per Cent of Entrants Who Will Probably Ultimately Graduate.........................
	7	Per Cent of Entrants Who Graduated from College of Original Entry.................
IV. Transfers	8	College to Which Maximum Transfer Was Made
	9	Number Transferred to College of Maximum Transfer..................................
	10	Total Number Who Made at Least One Transfer
	11	Per Cent of Entrants Who Transferred......
		Per Cent of Transfers Who Transferred During
	12	(a) their First year....................
	13	(b) their Second year..................
	14	(c) their Third year....................
	15	(d) their Fourth year..................
	16	Number of Second Transfers.................
V. Entrance Conditions	17	Modal Condition Subject.....................
	18	Per Cent of Total Conditions Which the Modal Condition Subject is:..............
	19	Per Cent of Entrants Who Entered With Conditions.................................
VI. Scholastic Average	20	Average Point-Hour-Ratio at Last Record of all Who Completed at Least One Quarter......
VII. Prediction of Point-Hour-Ratio		Correlation of Point-Hour-Ratio of Last Record with
	21	(a) Intelligence Test Percentile..........
	22	(b) Entrance Board's Estimate of High-School Record....................
	23	Correlation of Intelligence Test Percentile and Entrance Board's Estimate of High-School Record................................
	24	Multiple Correlation of Intelligence Test Percentile and Entrance Board's Estimate of High-School Record with Point-Hour-Ratio of Last Record.........................
VIII. Relative Scholastic Efficiency of Best 10 Per Cent Versus Poorest 10 Per Cent in Intelligence Test	25	Ratio Which Average Hours Credited in 15 Quarters by Best 10 Per Cent (as to Intelligence) bears to That of the Poorest 10 Per Cent....
	26	Ratio Which Average Points in 15 Quarters by Best 10 Per Cent (as to Intelligence) Bears to That of the Poorest 10 Per Cent........
IX. Prediction of Persistence		Correlation of Persistence With
	27	(a) Intelligence Test Percentile............
	28	(b) Entrance Board's Estimate of High-School Record.......................
	29	(c) First Quarter Point-Hour-Ratio........

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* Per Cent completing 6 quarters or more.

** Per Cent in attendance in June 1925, Spring Quarter.

*** Completed only the two-year curriculum.

Males					Females			M-F	
Agr.	Arts	C.-A.	Engr.	Phar.	Agr.	Arts	C.-A.	Educ.	Totals
124	449	342	350	88	88	269	51	197	1958
120	435	332	344	84	88	265	51	193	1912
18.5	25.8	27.2	26.6	78.4*	48.9	33.8	33.8	39.1	28.7
30.6	32.1	31.6	41.1	75.0**	52.3	34.2	35.3	44.2	35.0
20.2	7.1	14.0	15.1	55.7	38.6	24.2	25.5	35.0	18.1
35	Hard to Estimate	27	27	....	51	38	39	45	34
18.5	5.1	13.5	12.8	54.5***	33.0	11.2	17.6	29.4	14.4
C-A	C-A	Arts	C-A	C-A	Educ.	Educ.	Educ.	A.-C-A	C-A
7	56	14	24	3	14	62	6	10 & 10	206
15	182	29	59	6	22	102	11	25	451
12.1	40.5	8.5	16.8	6.8	25.0	37.9	21.6	12.7	23.0
53.3	46.7	69.0	83.1	66.7	72.7	53.5	54.5	76.0	58.1
33.3	25.3	27.6	16.9	33.3	18.2	38.6	36.4	12.0	26.8
6.7	23.1	....	....	....	9.1	5.9	9.1	12.0	12.2
6.7	4.9	3.4	....	....	....	2.0	....	....	2.9
4	18	8	7	0	3	15	1	9	65
Plane Geometry	Plane Geometry	Plane Geometry	Solid Geometry	Plane Geometry	Plane Geometry	Plane Geometry	Plane Geometry	Plane Geometry	Plane Geometry
90.0	66.7	85.6	33.3	100.0	70.0	60.2	81.9	100.0	
7.3	7.3	6.1	34.9	4.5	9.1	8.2	17.6	7.6	12.4
1.91	1.81	1.74	1.95	1.99	2.09	2.04	2.10	2.02	1.91
.54	.39	.44	.39	.44	.52	.43	.34	.54	.45
.37	.55	.39	.39	.30	.51	.42	.51	.52	.44
.27	.32	.28	.27	.23	.42	.22	.31	.25	.30
.59	.60	.52	.49	.48	.61	.54	.54	.67	.56
2.56	1.98	1.94	1.71	1.60	.94	1.43	...	1.71	1.78
3.92	2.64	2.69	2.29	2.57	1.35	1.86	...	2.50	2.46
.25	.32	.19	.17	.19	.04	.13	.15	.25	.19
.15	.31	.20	.21	.14	.20	.33	.22	.30	.23
.38	.54	.36	.40	.24	.51	.44	.29	.41	.40

TABLE 65

NUMBER OF STUDENTS FINISHING WORK IN A GIVEN QUARTER

Calendar Quarter		Number of Students Completing Work During the Calendar Quarter Shown in the Stub									
		Male					Female			Male and Female	
		Agr.	Arts	C-A	Engr.	Phar.	Agr.	Arts	C-A	Educ.	Total
1923–24	A	120	433	327	341	83	88	264	51	191	1898
	W	115	388	307	328	79	82	240	50	178	1767
	S	83	351	277	303	77	77	226	46	165	1605
	Su	8	34	16	51	3	7	28	2	27	176
1924–25	A	88	273	221	256	70	68	191	34	142	1343
	W	88	251	209	238	70	68	170	33	135	1262
	S	57	238	196	220	66	64	160	32	127	1160
	Su	10	28	16	27	1	7	18	3	23	133
1925–26	A	71	208	165	184	30	56	126	28	109	977
	W	71	201	152	174	29	50	123	25	108	933
	S	55	180	138	170	22	52	121	22	106	866
	Su	11	21	19	26	4	14	28	7	24	154
1926–27	A	58	168	124	151	18	51	103	21	95	789
	W	54	163	117	151	17	47	98	19	91	757
	S	38	144	108	141	12	46	92	18	87	686
No. of Entrants		124	449	342	350	88	88	269	51	197	1958

TABLE 66

PER CENT OF ENTERING* STUDENTS COMPLETING WORK IN A GIVEN QUARTER

Calendar Quarter		Per Cents* of Entrants Completing Work During the Calendar Quarter Indicated									
		Males					Females			Male and Female	All
		Agr.	Arts	C-A	Engr.	Phar.	Agr.	Arts	C-A	Edu.	
1923-24	A	96.8	96.2	95.6	97.4	94.3	100.0	98.1	100.0	97.0	96.9
	W	92.7	86.4	89.8	93.7	89.8	93.2	89.2	98.0	90.4	90.2
	S	66.9	78.2	81.0	86.6	87.5	87.5	84.0	90.2	83.8	82.0
	Su	6.5	7.6	4.7	14.6	3.4	8.0	10.4	3.9	13.7	9.0
1924-25	A	71.0	60.8	64.6	73.1	79.5	77.3	71.0	66.7	72.1	68.6
	W	71.0	55.9	61.1	68.0	79.5	77.3	63.2	64.7	68.5	64.5
	S	46.0	53.0	57.3	62.9	75.0	72.7	59.5	62.8	64.5	59.2
	Su	8.1	6.2	4.7	7.7	1.1	8.0	6.7	5.9	11.7	6.8
1925-26	A	57.3	46.3	48.2	52.6	34.1	63.6	46.8	54.9	55.3	49.9
	W	57.3	44.8	44.4	49.7	33.0	56.8	45.7	49.0	54.8	47.6
	S	44.4	40.1	40.4	48.6	25.0	59.1	45.0	43.1	53.8	44.2
	Su	8.9	4.7	5.6	7.4	4.5	15.9	10.4	13.7	12.2	7.9
1926-27	A	46.8	37.4	36.3	43.1	20.5	58.0	38.3	41.2	48.2	40.3
	W	43.5	36.3	34.2	43.1	19.3	53.4	36.4	37.2	46.2	38.7
	S	30.6	32.1	31.6	41.1	13.6	52.3	34.2	35.3	44.2	35.0

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* The number of entering students of the footings of the several columns of Table 65 are used as the base in calculating the percentages of this table.

TABLE 67

Numbers of Entrants With Quarters of Work Completed

Cumulative Number of Quarters of Attendance	Numbers of Students Completing at Least the Number of Quarters of Attendance Shown in the Stub									All
	Males					Females			Male and Female	
	Agr.	Arts	C-A	Engr.	Phar.	Agr.	Arts	C-A	Educ.	
1	120	435	332	344	84	88	265	51	193	1912
2	117	401	322	336	83	84	246	50	183	1822
3	106	364	292	321	81	79	232	47	175	1697
4	94	303	239	288	76	70	194	39	155	1458
5	83	284	221	276	75	67	179	38	143	1366
6	79	253	206	259	69	65	167	34	133	1265
7	72	214	169	207	36	59	140	30	122	1049
8	69	197	152	184	24	55	124	24	113	942
9	62	185	130	160	19	53	118	21	106	854
10	54	156	113	130	14	48	108	20	94	737
11	45	135	109	109	11	46	103	18	89	665
12	23	116	93	93	8	43	91	17	77	561
13	3	30	18	42	1	14	20	2	21	151
14	0	7	2	13	0	5	1	0	4	32
15	0	1	1	2	0	1	0	0	0	5
Number of Entrants..	124	449	342	350	88	88	269	51	197	1958

TABLE 68

Per Cents of Students Completing Given Number of Quarters

	Per Cents* of Entrants Completing at Least the Number of Quarters of Attendance Shown in the Stub									
Cumulative No. of Quarters of Attendance	Male					Female			Male and Female	Total
	Agr.	Arts	C-A	Engr.	Phar.	Agr.	Arts	C-A	Educ.	
1	96.8	96.9	97.1	98.3	95.5	100.0	98.5	100.0	98.0	97.6
2	94.4	89.3	94.2	96.0	94.3	95.4	91.5	98.0	92.9	93.0
3	85.5	81.1	85.4	91.7	92.0	89.8	86.2	92.2	88.8	86.7
4	75.8	67.5	69.9	82.3	86.4	79.5	72.1	76.5	78.7	74.5
5	66.9	63.3	64.6	78.9	85.2	76.1	66.5	74.5	72.6	69.8
6	63.7	56.3	60.2	74.0	78.4	73.9	62.1	66.7	67.5	64.6
7	58.1	47.7	49.4	59.1	40.9	67.0	52.0	58.8	61.9	53.6
8	55.6	43.9	44.4	52.6	27.3	62.5	46.1	47.1	57.4	48.1
9	50.0	41.2	38.0	45.7	21.6	60.2	43.9	41.2	53.8	43.6
10	43.5	34.7	33.0	37.1	15.9	54.5	40.1	39.2	47.7	37.6
11	36.3	30.1	29.8	31.1	12.5	52.3	38.3	35.3	45.2	34.0
12	18.5	25.8	27.2	26.6	9.1	48.9	33.8	33.3	39.1	28.7
13	2.4	6.7	5.3	12.0	1.1	15.9	7.4	3.9	10.7	7.7
14	0	1.6	.6	3.7	0	5.7	.4	0	2.0	1.6
15	0	.2	.3	.6	0	1.1	0	0	0	.3

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* The Number of entering students of Table 67 are used as the base in calculating the percentages of this table.

FIGURE 34

PER CENTS OF THE 1,958 ENTRANTS WHO COMPLETED WORK AT THE END OF THE DESIGNATED CALENDAR QUARTERS (SUMMER QUARTERS OMITTED)

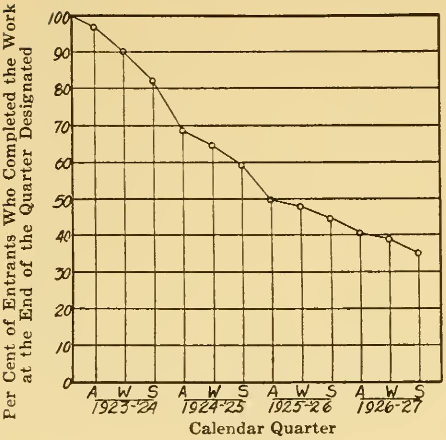


FIGURE 35

PER CENTS OF THE 1,958 ENTRANTS WHO COMPLETED AT LEAST ONE, AT LEAST TWO, ETC., QUARTERS OF WORK IN THE FIFTEEN QUARTERS OF POSSIBLE ATTENDANCE

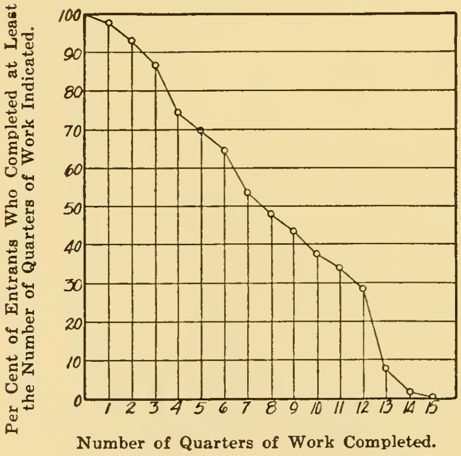


TABLE 69

Per Cents of Students Who Were Retarded

Calendar Quarter		Per Cents of Students in School during the Specified Calendar Quarter Who Were Retarded								
		Male					Female			Male and Female
		Agr.	Arts	C-A	Engr.	Phar.	Agr.	Arts	C-A	Educ.
1923–24	A	0	0	0	0	0	0	0	0	0
	W	0	0	1.0	.9	0	0	.4	0	.6
	S	1.2	1.7	3.2	1.3	0	1.3	1.8	0	2.4
	Su	0	0	0	2.0	0	0	7.1	0	0
1924–25	A	21.6	5.5	7.2	5.9	4.3	4.4	2.6	0	7.0
	W	26.1	7.6	12.0	7.6	4.3	4.4	3.5	9.1	12.6
	S	21.1	13.4	14.3	11.8	7.6	6.2	6.2	15.6	15.0
	Su	0	0	12.5	11.1	0	0	11.1	33.3	0
1925–26	A	35.2	19.7	20.0	17.4	23.3	3.6	8.7	17.9	17.4
	W	39.4	22.4	19.1	26.4	37.9	4.0	9.8	16.0	18.5
	S	29.1	18.9	21.7	32.4	36.4	7.7	11.6	13.6	17.0
	Su	9.1	0	5.3	7.7	25.0	0	28.6	42.9	20.8
1926–27	A	39.7	22.0	21.0	36.4	44.4	9.8	8.7	19.0	15.8
	W	44.4	23.9	18.8	37.1	52.9	8.5	9.2	10.5	15.4
	S	44.7	21.5	17.6	35.4	41.7	8.7	10.9	10.5	14.9

TABLE 70

Per Cents of Students Who Were Accelerated

Calendar Quarter		Per Cents of Students in School during the Specified Calendar Quarter Who Were Accelerated in their School Work								
		Male					Female			Male and Female
		Agr.	Arts	C-A	Engr.	Phar.	Agr.	Arts	C-A	Educ.
1923–'24	A	0	0	0	0	0	0	0	0	0
	W	0	0	0	0	0	0	0	0	0
	S	0	0	0	0	0	0	0	0	0
	Su	75.0	91.2	93.8	98.0	100.0	100.0	78.6	100.0	92.6
1924–'25	A	6.8	10.3	5.9	18.0	4.3	8.8	11.0	5.9	14.1
	W	6.8	10.3	5.7	16.8	4.3	8.8	11.8	6.1	14.8
	S	7.0	10.1	6.1	15.5	4.5	7.8	12.5	6.2	15.0
	Su	40.0	89.3	68.8	70.3	100.0	85.7	77.8	33.3	82.6
1926–'27	A	8.5	17.8	10.3	21.7	3.3	17.9	17.5	7.1	16.5
	W	8.5	14.9	8.6	20.7	0	16.0	17.1	4.0	15.7
	S	10.9	14.4	8.7	20.0	0	15.4	16.5	4.5	17.0
	Su	63.6	85.7	78.9	92.3	50.0	92.9	64.3	0	62.5
1925–'26	A	12.1	20.8	17.7	27.8	11.1	31.4	25.2	14.3	23.2
	W	7.4	19.6	17.9	27.8	11.8	31.9	23.5	15.8	23.1
	S	7.9	20.8	15.7	29.2	8.3	30.4	19.6	10.5	23.0

TABLE 71

Distribution of Transfers

College Originally Entered	Number of Entrants	Numbers of Students who Transferred to the College of															Total
		Agriculture	Applied Optics	Arts	Arts—Education	Arts—Law	Arts—Medicine	Commerce	Dentistry	Education	Engineering	Law	Medicine	Pharmacy	Science—Med.	Graduate	
Engineering	350	2	1	22				24		6		2		2			59
Agriculture (Women)	88			5				3		14							22
Agriculture (Men) ..	124		2	2		1		7	1			1		1			15
Arts (Men)	449	9	2		9	7	2	56	22	13	15	20	19	4	3	1	182
Arts (Women)	269	4	1		13		2	28		49		4	1				102
Commerce (Men)	342	1		14						3	4	5		2			29
Commerce (Women) .	51			5	1					5							11
Education	197	5		8	2			10									25
Pharmacy	88			1				3		2							6
Total	1958	21	6	57	25	8	4	131	23	92	19	32	20	9	3	1	451
Per Cent of Transfers Who Transferred to Specified Colleges....		4.7	1.3	12.6	5.6	1.8	0.9	29.0	5.1	20.4	4.2	7.1	4.4	2.0	0.7	0.2	100.0

FIGURE 36

FREQUENCY DISTRIBUTIONS OF THE CUMULATIVE POINT-HOUR-RATIO OF STUDENTS WHOSE HIGH SCHOOL RECORD WAS RATED BY THE ENTRANCE BOARD AS "GOOD," "AVERAGE," AND "POOR." (THE THREE MEANS INDICATED ARE THE MEANS OF THE THREE RESPECTIVE GROUPS: M_P IS THE MEAN OF THE POOR, M_A IS THE MEAN OF THE AVERAGE, AND M_G IS THE MEAN OF THE GOOD). THE NUMBER RATED GOOD WAS 399. THE NUMBER RATED AVERAGE WAS 1,223. THE NUMBER RATED POOR WAS 290

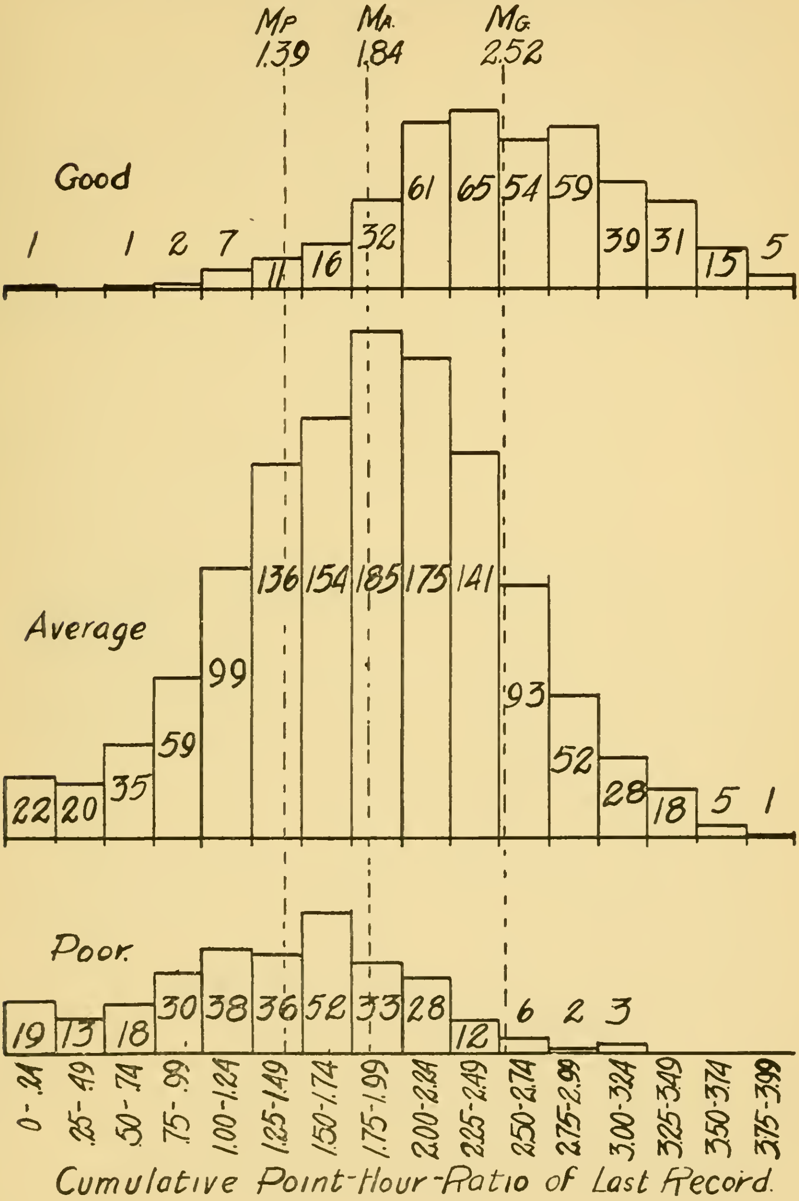


FIGURE 37

Per Cents of the 1958 Freshman of 1923 Who:

(a) Graduated from the College of Original Entry;
(b) Graduated from a Transferred to College;
(c) Did Not Graduate in Four Years: But Work Satisfactory at Last Time of Record;
(d) Did Not Graduate in Four Years: But Work Unsatisfactory at Last Record.

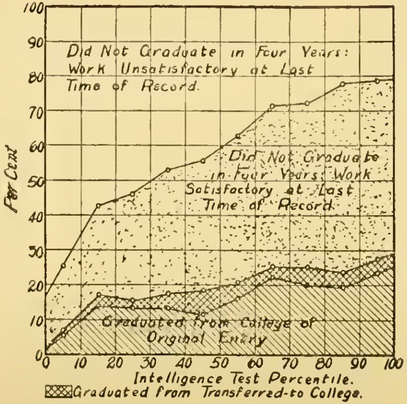


FIGURE 38

Per Cents of Various Intelligence Test Percentiles Who:

(a) Did Not Graduate in Four Years: But Work Unsatisfactory at Last Record.
(b) Did Not Graduate in Four Years: But Work Satisfactory at Last Time of Record;
(c) Graduated from a Transferred to College;
(d) Graduated from the College of Original Entry.

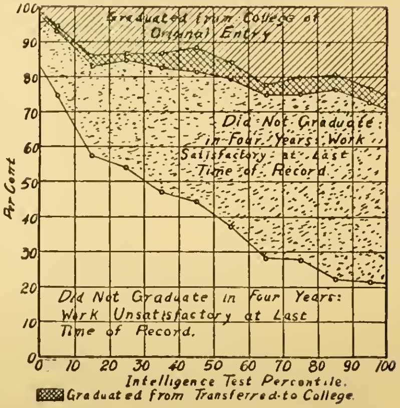
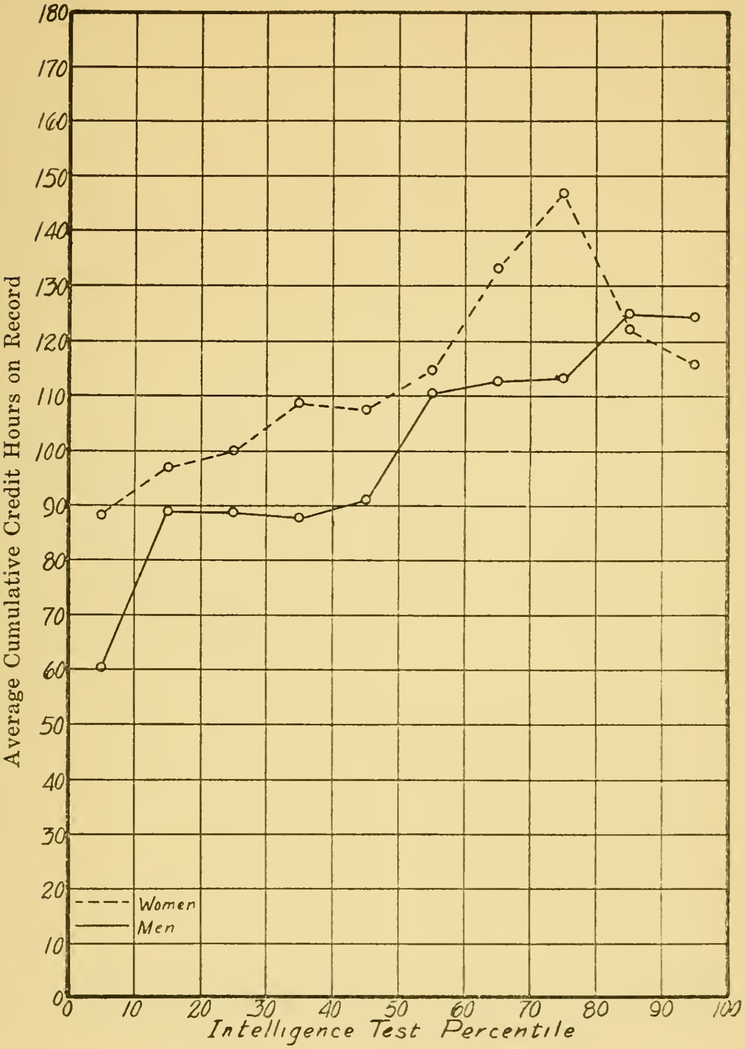


FIGURE 39

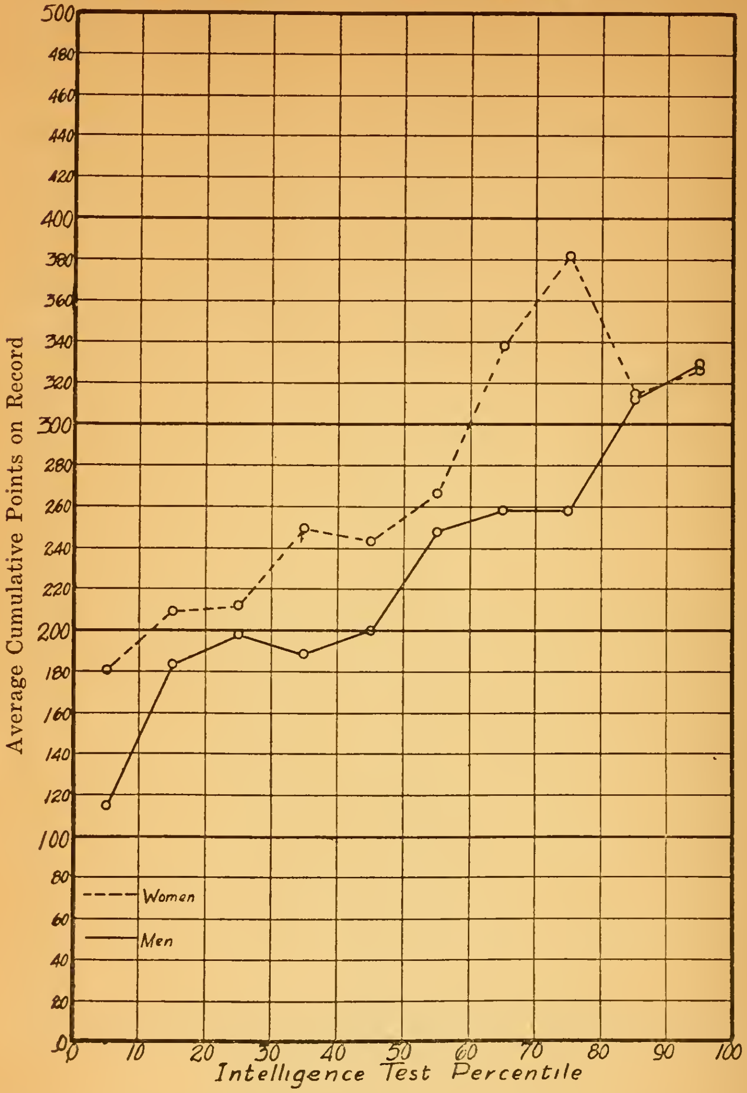
Average Cumulative Credit Hours on Record on the Registrar's Books at the End of Fifteen Successive Possible Quarters of Attendance for Men and Women of the Different Intelligence Test Percentiles



No. Cases										
Women	58	56	63	61	65	65	54	49	53	47
Men	142	128	122	155	125	143	139	130	162	141

FIGURE 40

Average Cumulative Points at the End of Fifteen Successive Possible Quarters of Attendance for Men and Women of the Different Intelligence Test Percentiles



No. Cases										
Women	58	56	63	61	65	65	54	49	53	47
Men	142	128	122	155	125	143	139	130	162	141